A General Idea OF THE EPITOMY OF THE WORKS OF *Robert Boyle*, Esq;

To which are Added

General HEADS FOR THE Natural HISTORY OF A COUNTRY.

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THE PREFACE

HAving already Epitomized the Honourable Author's Works, I thought it might not be amiss to give the Reader a short View of what hath been taught in the foregoing Epitomy; *for tho' I question not but that most Readers are sufficiently able to remember what is contained in those Volumes, yet it may be of use to some to recollect their Memories, by putting them in mind of the most General Doctrines contained therein: I say, the most General, because in this short Abstract the Reader must not expect that I should comprize the Contents of the whole Epitomy, since the greatest part of that consists of Experiments laid down as Proofs of what the Author hath, upon particular Occasions, asserted; which Experiments could not be decyphered in much fewer Words than I have made use of: All therefore that I now pretend to, is, to shew what is generally taught in those Papers, without laying down any Proofs at all, and without*

making use of more Words than are sufficient to express his General Assertions. So that if the Reader questions the Truth of any thing contained in these Sheets, he is desired to turn to the Epitomy, *where he will find the same things laid down more largely, and abundantly proved by Particular Experiments.*

Note, That every Chapter contains a Book of the *Epitomy*, and every Section the Contents of a distinct Chapter.

As for the General Heads *laid down for the Promoting of the* Natural History of a Country, *the Reason why I have annex'd them to this* General Idea, *is, That they might be bound up alone without the* Epitomy, *for the sake of those who go beyond Seas, and desire only to carry along with those Directions General Notions of Mr.* Boyle's *Philosophy: Which if it may be of use to such, it will answer the Design of the Reader's*

Humble Servant,

R. BOULTON.

A General Idea OF THE WORKS Of the Honourable *ROBERT BOYLE*, Esq; EPITOMIZ'D.

CHAP. I.

SECT. I.

HAVING already so far Epitomized the Honourable Author's Works, that the Reader might have an entire View of what that Learned Promoter of Useful Knowledge had writ, without being at the Pains and Trouble to read over so many distinct Tracts, and those less useful Digressions and Prolixities which most People complain rendered that Author's Works too tedious; I shall now, for Reasons already of-

fered in my *Preface*, proceed to give a *General Idea* of that *Epitomy*.

And first he teaches, That the Matter of all Natural Bodies is the same, *viz.* A divisible, impenetrable, and extended Substance.

And since, were all the Parts of Matter perpetually at rest, there could be no Change in Matter, in order to form a Variety of Natural Bodies, it was requisite there should be a variously determined Motion in all the Parts of it, or at least some of them; and Matter being naturally divided into Parts by Motion, the Parts divided must have a peculiar Size and Shape, and either Rest or Motion; so that Matter hath these Three Primary Affections, *Magnitude*, *Shape*, and either *Rest* or *Motion*. And

These Primary Affections of Matter being allowed, it will follow, that there must be a certain Position or Situation of the Parts of Bodies so divided; and the Disposition and Contrivance of the Parts of the Whole may reasonably be called their Texture or Modification; and consequently as that Texture or Modification is different, the Qualities of that Body will vary; for as the Disposition of the Parts of a Body are peculiarly adapted to cause such or such Effects, its Power to cause them gives us Reason to say it is endowed with such Qualities, in reference to the Bodies acted on.

And as for the Forms of Bodies, so much disputed by Philosophers, we may easily suppose them to be owing to an Association of Accidents requisite to compose a Body of this or that

that kind, the Texture of which, united, may reaſonably be call'd their *Form*; and that a Convention of Accidents is capable of performing what we uſually aſcribe to a *Form*, is evident, ſince they are ſufficient to diſcriminate it from all other Species of Bodies.

Nor will it be difficult to explain Generation, Alteration, and Corruption by the aforementioned Doctrine; for when there is ſuch a Concurrence of Accidents as are requiſite to conſtitute any Species, a new Species is ſaid to be genreated, pre-exiſtent Matter acquiring a new kind of Exiſtence or Modification; and when that Eſſential Modification is diſſolved, the Body is ſaid to be corrupted: And as for Putrefaction, it ſeems to be but a ſlower kind of Corruption, where the eſſential Qualities of a Body are only more ſlowly altered, but not deſtroyed.

SECT. II.

Theſe things premiſed in General, concerning the Origin of all mixed Bodies, it may be ſeaſonable to note farther, in Reference to Particular Qualities, That in Compound Bodies they are very much different from thoſe belonging to the ſeperate Ingredients; ſo that Qualities may reſult from Mixtures as well as from an Alteration of the Texture, and Motion of the Parts of the Ingredients.

But we are not always to conſider the Effects of mixed Bodies as the bare Reſult of the Parts of Matter of ſuch a determinate Texture, but placed amongſt other Bodies, on which

they may variouſly act and be acted on, as the Agents and Patients differ amongſt each other, in reſpect of their Size, Shape, Poſture, Order, Texture, Pores, or Effluviums, Reſt or Motion; upon which accounts they are able to produce a great Variety of Effects: For we ſee a ſtrange Variety of Sounds produced alone by Muſical Inſtruments, not to mention a vaſt Number of other Accidents owing to it. But there are not only Qualities very various in Effects in ſeveral Bodies, but even in the ſame that are *homogenious* as to ſenſe. Inſtances of which are at large produced in the Second Chapter of the *Epitomy*, Vol. I. p. 26.

SECT. III.

In the Third Chapter of the *Epitomy*, Vol. I. Book I. Reaſons are offered againſt the *Ariſtotelian* Doctrine of Forms; from whence it appears, That the ſubſtantial Forms urged by the Schools are not the Cauſes of the various Forms of Mixed Bodies, but that they really depend on the different Textures and Modifications of the Compound.

SECT. IV.

Chap. IV. ſhews, That tho' the Ingredients of a Compound uniting, make one Form, yet each of the Ingredients retain their peculiar Attributes and Qualities, and have each their peculiar Forms; which tho' they are ſubordinate to the General Form of the Compoſition, yet

yet they are nevertheleſs Specifick, in reſpect of thoſe Ingredients they belong to, as each Part of a Tree hath its peculiar Forms, diſtinct from the Form of the Whole, accordingly as the Juices and Virtues of the Salt of thoſe Parts differ, and as their eſſential Textures vary.

And in this Chapter we are farther told, That the Faculties and Virtues of Animals and Plants depend not wholly on the Forms of mixed Bodies, conſidered as ſuch, ſince the Effects of a Compound Body may be attributed to the mixed Action of the Compound Ingredients, each of thoſe Bodies co-operating and modifying each others Actions; and this is evident, ſince, upon a Diſſolution of that Union, each Body hath its determinate Form and Virtue.

But here we muſt take notice, That ſometimes, when the Specifick Form of a Body is deſtroyed, the Qualities remaining may not always be the Reſult of united, ſubordinate Forms, but depend on the determinate Forms of particular Parts of that Body; and ſometimes ſeveral new Qualities may be added to a Body upon the Abolition of a ſpecifick Form, by the Influence of external Agents.

And to what hath been ſaid concerning ſubordinate Forms, we may add the following Particulars.

I. That it is no difficult Matter to determine the Nobleneſs of Forms.

II. Tho' ſeveral Alterations are made in Bodies by a Receſs or Acceſs of Qualities, yet they retain the ſame Denomination, and are ſaid to have

have the ſame Form, by reaſon of ſome Eminent Quality or Uſe.

III. Several Effects will be produced by Compound Bodies, upon the account of the Union and Joint-Action of their Ingredients.

IV. Sometimes a ſuperadded Form is accidental to a pre-exiſtent; yet it modifies the Operation of it, without altering its Nature.

V. Beſides the Operations of a Body, which are ſpecifick, in reſpect of the whole, it may have ſeveral Effects depending on the ſeperate and particular Properties of an Ingredient.

VI. That is often called the ſpecifick Form in Bodies, which is not the preſiding, but the moſt eminent.

VII. The Forms of a Body, generally called Subordinate, may with more Reaſon be called Concurrent, ſince upon their Coalition depends the Form of the Whole.

SECT. V.

The Fifth Chapter ſhews, That a ſlight Variation of Texture produced by Motion, is able to diſcriminate Natural Bodies, and to cauſe them to have different Effects; as Ice and Salt will freeze other Liquors, tho' Water and Salt will not: Where it is alſo made to appear, that the Productions of Art are really the Effects of Nature, ſince the Artiſt only puts Natural Bodies together, but their Effects are really produced according to the Laws of Nature.

SECT.

SECT. VI.

The Sixth Chapter teaches, That the curious and various Figures of Salts may be produced without the Aſſiſtance of a Plaſtick Power, and may reſult from a bare Connexion of Metalline and Saline Bodies; and their Figures may vary according to the different Quantities of Liquors, or the Space of Time they ſhoot in. And as for Acids, they are obſerved to ſhoot into Chryſtals, variouſly figured, according to the Nature of the Menſtruum, or the Bodies it works upon; and that by ſlight Alterations, without the Aſſiſtance of ſubſtantial Forms, Salts may be obtained, appears from ſeveral Experiments laid down in that Chapter.

SECT. VII.

The Eighth and Ninth Chapters, containing ſeveral Experiments, from whence it appears, conſonant to what hath been already delivered, That by Alteration of Texture, and a new Modification of Matter, ſeveral Changes may be wrought in Bodies, without the Help of ſubſtantial Forms: From which Experiments ſeveral Inferences are drawn to ſhew the Abſurdity of the *Ariſtotelian* Principles.

SECT.

SECT. VIII.

The Tenth Chapter contains ſeveral Experiments, to ſhew, That by an Alteration of the Textures of Bodies, ſeveral Qualities may be deſtroyed in a Body, and regained again, and particularly in Salt-petre: As alſo, That the ſame Particles of Matter may have different Effects, when in a fluid Form, from what they have when ſolid. And in the ſame Chapter it is made to appear, That Chymiſtry rather deſtroys than diſcovers the Principles of Natural Bodies.

SECT. IX.

In the Eleventh Chapter, which contains the Hiſtory of *Fluidity*, we are told, That a Body is ſaid to be fluid, becauſe it conſiſts of Parts which eaſily ſlip upon one another's Surfaces, to which they are inclined by their porous Interſtices; and becauſe, by the Motion of their Parts, they ſpread and diffuſe themſelves on every ſide, till oppoſed by ſome ſolid Body, to the Superficies of which they adapt themſelves.

And in the ſame Chapter we are farther taught, That in order to render a Body fluid, it is requiſite the Parts of them ſhould be very minute, as alſo of a determinate Figure; That there ſhould be Pores betwixt their Parts, and that their Parts ſhould be in a perpetual and a variouſly determined Motion. It alſo ſhews us how a Fluid may be obtained from a Conſiſtent

ſiſtent Body; and having illuſtrated the Doctrine of *Fluidity* by Experience, it farther makes it evident, That the Reaſon why ſome Fluids will not mix with others, is only their particular Textures, and peculiar Motion of their Parts.

SECT. X.

The Twelfth Chapter ſhews, That the Superficies of Liquids preſſing one againſt another, give each other different and determinate Figures.

SECT. XI.

The Thirteenth Chapter gives us the Hiſtory of *Firmneſs*, and tells us, That Solidity conſiſts in this, *viz.* That the groſs Parts of ſolid Bodies are ſo interwoven together, that they are unapt to diffuſe themſelves ſeveral ways, like Fluids; and that the Figure of their Superficies is chiefly owing to the Connexion of the Parts that compoſe them, rather than to outward Bodies; ſo that theſe Three Things ſeem chiefly to be the Cauſes of Solidity, *Groſsneſs of Parts*, *Reſt*, and the *Implication of their Conſtituent Parts*.

In this Chapter he alſo teaches, That a Juxta-Poſition of Parts is not the only Cauſe of Coheſion, but that the weight and ſpring of the Air is one great Cauſe; nevertheleſs a Juxta-Poſition of the Parts of Glaſs ſeems requiſite and ſufficient to make ſo compact a Subſtance, the Parts of the Matter of which it is compoſed being

being first minutely divided by the Fire before their Union. And

In this Chapter he farther teaches us, That the Figures and Textures of the Parts of a Body may not only contribute to their Solidity, but that some Liquids may become solid upon the Interposition of the minute Parts of another Body; and that a Liquor may become solid upon the Addition of a Powder only. And

In the same Chapter we are farther taught, That fluid Bodies consist not of Parts divisible into Fluid, as Quantity into Quantity; That there is a Plastick Power inherent in several Bodies, and that Mixture is sufficient to produce Petrifaction.

SECT. XII.

The Fourteenth Chapter contains several Instances, to shew, That there is a Motion in the Parts of Consistent and even Solid Bodies.

SECT. XIII.

The Fifteenth Chapter, treating of the great Effects of languid and unheeded Motion, brings several Instances and Observations to prove

I. The great Efficacy of Celerity in Bodies very small, especially if the space they move through be but small, as in Lightning.

II. That the insensible Motion of so soft Bodies

dies as Fluids, may have a ſenſible Operation upon ſolid Bodies, as in Sounds, when they ſhake the Windows of a Houſe, *&c.* at a conſiderable diſtance.

III. The Number of the inſenſible Parts of Matter put into Motion, enables them to perform ſeveral things.

IV. That Local Motion may be propagated through ſeveral Mediums, and even Solid Bodies.

V. The Effects of particular Modifications of the Inviſible Motions of Fluids on Animal Bodies diſpoſed to be worked upon by them, are very conſiderable, as when a particular Note of a Muſical Inſtrument hath a peculiar Effect upon particular Animals.

VI. The Effects of Fluids upon inanimate Bodies, upon the account of a particular Texture and Modification of the Agent and the Patient, are alſo conſiderable.

VII. Some Bodies are looked upon to have their Parts abſolutely at reſt when they are only in a State of Tenſion or Compreſſion.

VIII. We are too apt to take notice of the viſible Effects of Bodies one upon another, without conſidering the inteſtine Motion of their Parts.

CHAP.

CHAP. II.

SECT. I.

THE First Chapter of the Second Book, treating of the Cosmical Qualities of Things, teaches us, That Cosmical Qualities depend partly on the Influence of external Agents, as well as the primary Affections of Matter. So that

I. Some Bodies are altogether inactive, till they are acted on; and that others are put into Action chiefly by the Influence of Catholick and unheeded Agents.

II. There are several Bodies, which, when put into Action, are subtle enough to insinuate themselves into the Pores of other Bodies, which they are forced to act on by the established Laws of Nature; an Instance of which we have in the Expansive force of Beans soaked with Water.

III. An Alteration of the Mechanical Texture of a Body, is enough to dispose it, or render it unapt to be worked on by those unheeded Agents.

SECT. II.

In the Second Chapter he proposes the following Suspicions or Conjectures.

I. That

I. That there are ſeveral Parts of Matter in the Æther, which are variouſly diſpoſed to work upon Bodies, according to the various Textures of thoſe Bodies they chance to work upon, or according to the difference of the Agents they work concurrently with.

II. He tells us, That ſeveral People have diſcovered Peſtilential Steams in the Air, before they began to act as ſuch upon other Bodies.

III. He ſuſpects, That there have been Changes conſiderable enough in the Internal Parts of the Earth, from whence may be deduced a Reaſon of the irregular Variation of the Mariners Needle.

IV. He ſuppoſes the Ebbing and Flowing of the Sea, and ſuch like *Phænomena*, to proceed from ſome Coſmical Law of Nature; or that the Planetary Vortex may be not a little concerned in the producing ſuch Effects.

V. He ſuppoſes all Endemical and Epidemical Diſtempers to be chiefly owing to the Influence of thoſe Globes which move about vs, and the Terreſtrial Effluvia of our own Globe.

SECT. III.

The Third Chapter, treating of the Temperature of Subterraneal Regions, as to Heat and Cold, divides them into Three Regions, and tells us, That the Bounds, as well as Temperature of the Firſt, are very different.

That the Temperature of the Second ſeems to be colder than that above or that below it,

being remoter both from the Influence of External as well as Subterraneal Heat.

In ſeveral Places, which may be referred to this middle Region, the Temperature of the Air is different at the ſame Seaſons of the Year; beſides, the different Temper of Subterraneal Regions may be varied by the Soil.

And farther, The Temper of the Third Region is warm, which Warmth varies in ſeveral Places.

SECT. IV.

In the Fourth Chapter he only aſſigns Two Regions to the Sea, the one extended from the Superfices of the Water, as far as the Sun-Beams penetrate, and the other from thence to the utmoſt Depth of the Water; ſo that the upper-Region muſt vary, as to its Extent, according to the Difference of the Climate, and the Heat of the Sun, or the Nature of the Soils about the Shore; as for the lower-Region it is generally cold.

SECT. V.

The Fifth Chapter informs us, That the bottom of the Sea is very rough and unequal; That the Water gravitates conſiderably upon Bodies immerſed in it; That the Bottom of the Sea is not diſturbed with Storms, but that the Water almoſt ſtagnates.

SECT.

SECT. VI.

The Sixth Chapter gives the following Account of Coral, *viz.* That when firſt taken up, it is ſoft, flexible, and very pale; but when the Bark is taken off, and it hath been expoſed to the Air, its natural Redneſs preſently appears. It is much paler on the Inſide, than on the outward Superfices.

This Chapter likewiſe informs us, That ſeveral Trees in *Africa* are obſerved to grow under Water.

SECT. VII.

The Proportion of Salt to Water in Sea-Water, is obſerved to be as One to Forty; which Salt is ſupplied by Salt-Rocks, contiguous, or near the Water; or by Salt waſhed away and carried along by Springs and Rain-Water, which float into the Ocean, or by Latent-Springs.

As for the Bitterneſs commonly obſerved in Sea-Water, it probably proceeds from ſome bituminous Bodies, carried along with Spring-Water into the Sea. And to theſe Obſervations he adds, That Agitation is very requiſite to keep Sea-Water from ſtinking; and as to its Saltneſs, That it is obſerved to differ much in the Degrees of its Saltneſs.

SECT. VIII.

The Eighth, Ninth, Tenth, and the Eleventh Chapters, chiefly conſiſts of Queries propoſed for the Natural Hiſtory of Mineral Waters: Therefore I ſhall only take Notice here, that he gives the following Directions in trying Mineral Waters.

1. To obſerve the Changes of Colours made by Tinctures, in a good Light, which may help to diſtinguiſh what Mineral Tinctures they are impregnated with.

2. To vary the Shades of Colours produced by Mineral Waters, either by dropping ſuch Waters upon Paper, whoſe Pores are ſalurated with powdered Vitriol, or tinged with a Decoction of Logwood. Several Variations in Colours may be alſo made by dropping other Medicinal Liquors either into the Mineral Waters, or the Infuſion of Galls, either before or after.

3. He recommends for ſuch Trials, not only the Parts of Aſtringent Plants, but Animal, and eſpecially Mineral Subſtances.

SECT. IX.

In the Twelfth Chapter he tells us, That the Natural States of Bodies vary according to the Difference of Climates; ſo that it is the Natural State of Water in ſome Parts and Seaſons, to

to be froze, and turned into Ice, and in others to be always fluid. And he farther adds, That all violent States of Matter are not preternatural; and that it is a common Error, That nothing violent is durable, ſince it is evident, that the *Atmoſphere* we live in is always in a forced or a compreſſed State.

SECT. X.

The Thirteenth Chapter contains a Deſcription of Mr. *Boyle*'s *Pneumatick Engine*, as alſo ſeveral Experiments tried with it; from whence it appears, That the Air acts upon moſt Bodies, by virtue of its Springineſs, by which it is inclined always to expand; and by its Weight, by which it in its Gravitation preſſes upon Bodies below it, proportionably to the Weight of an incumbent Pillar of Air: And by virtue of this Weight it is that Mercury is raiſed in Weather-Glaſſes, and Water in Pumps.

And by ſeveral other Experiments made in an exhauſted Receiver, it appears, That tho' Gunpowder will not explode when the Air preſſes not upon it, nor will Fire burn: Yet in the exhauſted Receiver it is obſerved, That a Loadſtone hath, externally applied, conſiderable Effects on Bodies contained in it; but Sounds are not propagated in *vacuo*.

In this Chapter he likewiſe farther teaches why two flat poliſhed Marbles adhere to each other, *viz.* By the Compreſſion of the *Atmoſphere*. As alſo, he tells us, That the Weight of the *Atmoſphere* was able to raiſe a Hundred

Pound Weight, tied to the Sucker of the Pump, depreſſed, when the Receiver was exhauſted.

And in this Chapter he farther adds Experiments, which ſhew, That the Preſſure of the Air is the Chief Cauſe of Filtration: And as for the Diſtinction of the Proportion betwixt the Weight of Air and Water, he proves it to be but as 1 to 938; That the Proportion of Quick-ſilver is as 14000 to 1.

And beſides theſe, he hath made ſeveral Experiments and Obſervations, which prove what Effects the Exhauſted Receiver hath on Animals included in it, and how long they are able to continue alive without Air.

SECT. XI.

The Fourteenth, Fifteenth, Sixteenth, and Seventeenth Chapters, only contain a Defence of what hath been delivered in the foregoing Chapter; or Objections againſt what other Men have taught. And the Subjects of the following Chapters, to the Twenty ninth, being of the like nature, I ſhall not here tell what Notions he hath confuted; but ſince he hath taught nothing, but only defended his former Aſſertions, I ſhall refer the Reader to the *Epitomy*.

SECT. XII.

The Nineteenth Chapter only contains a Deſcription of an Engine made uſe of in the Experiments which fill up the next Chapter; where it

it is made to appear, That Air is able barely by its Spring to raiſe Mercury in a Tube; as alſo, That Heat may be cauſed by a bare Attrition in an exhauſted Receiver; That the Spring of the Air is able to burſt Bladders, and to raiſe a conſiderable Weight; as alſo, That ſuch one is able to raiſe Mercury no higher than the Weight of the *Atmoſphere* is able to impel it; and likewiſe to what heighth Mercury and Water may be raiſed proportionably to their Specifick Gravity.

And in this Chapter we are farther told how to diſcover the Preſſure of the Air by *the Touch*, and how to make portable Baromelers; as alſo we are here taught, That in an exhauſted Receiver a Spring may be raiſed without any difficulty; yet when the Air is let in, it will be violently depreſſed again, and not be raiſed again ſo eaſily.

And in the ſame Chapter it is likewiſe made to appear, That Cupping-Glaſſes are cauſed to ſtick by the Preſſure of the Air.

There are ſeveral other Particular Experiments contained in this Volume, which I ſhall not here take notice of, for Reaſons offered in my *Preface*.

CHAP. III.

SECT. I.

THE First Chapter of the Third Book, beginning the Second Volume, contains several Experiments to prove farther the Weight and Spring of the Air; from whence it appears, That the Cause of the Ascent of Water in Syringes is to be derived from the Pressure of the Air; That Light may be produced in *vacuo Boyliano*; That by a small Quantity of included Air 50 or 60 Pound, or a greater Weight, may be raised in the exhausted Receiver.

SECT. II.

The Second Chapter contains Descriptions of several Engines made use of in succeeding Experiments.

SECT. III.

The Third Chapter shews, That the Productions of Air may be helped several ways, and that it may be obtained from Bread, Grapes, Raisins, Plumbs, Mustard, boiled Apples, *&c.*

In this Chapter we are likewise told how the Production of Air may be hindred, as by Cold, by making use of Spirit of Wine along with the Body

Body included in *vacuo*; or by employing Vinegar, by Compreſſion; by Water, or Leaven.

And in this Chapter we are farther taught, That the Effects of Artificial Air are different from the Effects of Common Air; as alſo, That the Effects of Compreſſed Air are different from thoſe of Common Air; That Animals cannot live in Artificial Air; That the Conſumption of Combuſtible Matter is promoted by the Condenſation of the Air; That Air is produced from dried Fruits, without any Regularity; That Bodies afford as much Air as they can before they putrifie; That Artificial Air may be deſtroyed; That Liquors may acquire a Sourneſs, tho' no Spirits evaporate; That fermented Liquors may preſerve Fruit; That Beer may preſerve Beef; and, That tho' Fiſhes yield not ſo much Air as Fleſh, yet they will corrupt, tho' not affected by the outward Air; That Butter may be preſerved a long time, if kept from the Contact of the outward Air; That Sugar does not preſerve Fruit as well as fermented Liquors; Fleſh may be kept freſh, if kept in a ſtrong compreſſed Air, in a Receiver.

SECT. IV.

The Fourth Chapter ſhews, That Bodies may be preſerved a long time in *Vacuo Boyliano*, without boiling.

SECT.

SECT. V.

The Fifth Chapter ſhews, That Air may become unfit for Reſpiration, and yet retain its uſual Preſſure; and alſo ſeveral Experiments, to ſhew how long ſome ſort of Animals may live without Air longer than others.

SECT. VI.

The Sixth Chapter contains Animadverſions on Mr. *Hobbe*'s *Problemata de Vacuo*; and proves, That the *Atmoſphere* is the chief Cauſe of the Riſe of Water upon Suction.

SECT. VII.

The Seventh Chapter delivers the Cauſe of Attraction by Suction, and tells us, That it chiefly depends on the external Preſſure of the Air, when it is taken off the Internal Surface of the Liquor in a Tube: And farther,

I. That a Liquor may be raiſed by Suction, when the Preſſure of the Air, neither as it hath Weight, nor Elaſticity, is the Cauſe of its Elevation.

II. That the Weight of the Atmoſpherical Air is ſufficient to raiſe up Liquors by Suction.

SECT.

SECT. VIII.

The Eighth Chapter contains Obſervations and Directions about the *Barometer*; and the Ninth contains only a Deſcription of a new kind of *Baroſcope*.

SECT. IX.

The Tenth Chapter contains a Diſcovery of the admirable Rarifaction of the Air, without Heat, it being rarified ſo as to poſſeſs 8232 times, its former Dimenſions, and ſometimes to 10000.

SECT. X.

The Eleventh, Twelfth, and Thirteenth Chapters, ſhew, That the Duration of the Spring of expanded Air is very conſiderable; That the Air may be compreſſed into an eighth part of its former Space; That the Proportion, as to the Degrees of Rarification and Condenſation, is as 1 to 70.

SECT. XI.

The Fourteenth Chapter gives us a brief Account of the Utilities of *Higgroſcopes*, and tells us, That the General Uſe is to eſtimate the Changes of the Air, as to moiſture and drineſs; and the particular Uſes of them is to know the differing

differing Variations of Weather in the ſame Month, Day, and Hour; To know how much one Seaſon is drier or moiſter than another; To diſcover and compare the Changes of the Temperature of the Air, made by Winds, ſtrong or weak; Froſty, Snowy, and other Weather; To compare the Temperature of differing Houſes and differing Rooms in the ſame Houſe; To obſerve in a Chamber the Effects of the Preſence or Abſence of Fire in a Chimney or Stove; To keep a Chamber at the ſame Degree or aſſigned Degree of Drineſs.

SECT. XII.

The Eighteenth Chapter ſhews the Efficacy of the Air's Moiſture, in contracting Ropes, ſwelling of Timber, and burſting of Marcaſites.

SECT. XIII.

The Nineteenth Chapter contains an Account of ſome unheeded Cauſes of the Inſalubrity and Salubrity of the Air, under the following Propoſitions:

I. That it ſeems probable, that in divers Places, the Salubrity or Inſalubrity of the Air, conſidered in General, may be in good part due to the ſubterraneal Expirations, eſpecially thoſe called Ordinary Emiſſions.

II. It

II. It is probable, that in divers Places ſome Endemical Diſeaſes do chiefly or partly depend on Subterraneal Steams.

III. It is likely that divers Epidemical Diſeaſes are in great part produced by Subterraneal Effluvia.

IV. It is probable that moſt of the Diſeaſes that Phyſicians call New ones, are cauſed either chiefly or concurrently by Subterraneal Steams.

SECT. XIV.

The Twentieth and Twenty firſt Chapters ſhew, That there are ſeveral Latent Qualities in the Air, which ariſe from the Union and Conjunction of other Bodies with it, ſome of which may poſſibly be raiſed by the Heat of the Sun Beams; and alſo, That the Air ſeems to contain in it all ſorts of Seminal Principles.

SECT. XV.

The Twenty ſecond Chapter contains an Endeavour to Improve Artificial Magnets. And the Twenty third and fourth Chapters ſhew, That Magnetical Qualities depend on a Mechanical Conſtruction of the Conſtituent Parts of a Body, ſince that Quality may be altered by the Effects of Fire, and other Concurrent Accidents, which can only Mechanically affect it.

SECT.

SECT. XVI.

The Twenty fifth Chapter proves, by ſeveral Experiments, That Electricity may be Mechanically produced or deſtroyed.

SECT. XVII.

The Twenty ſixth Chapter contains a General Hiſtory of the Air; in which, ſince nothing is contained but what is Hiſtorical, it is not poſſible to relate the Subſtance in leſs room than it is there contained.

CHAP. IV.

SECT. I.

THE Firſt Chapter of the Fourth Book proves, That Taſtes may be Mechanically produced.

SECT. II.

The Second and Third Chapters prove, That Odours and Colours depend on a Mechanical Texture of the Body endowed with them.

SECT. III.

The Fourth Chapter contains an Experimental Hiſtory of Colours; from whence it appears, That Diverſity of Colours frequently denote different Properties in Bodies, and that the Perception of Colours depends on a particular Motion given to the Spirits in the Retina, and communicated to the Brain.

As for the Cauſe of Colours, it depends on the various and differently modified Superficies of Bodies, or the various Figures of the ſuperficial Parts, and their Situation, and ſometimes the Motion of a Body, by which it is enabled to reflect the Rays of Light variouſly to the Eye.

As

As to Particular Colours, in the Fifth Chapter we are told, That Whiteneſs depends on ſuch a Superficial Texture as reflects the Rays of Light, not upon one another, but upon the Spectator's Eye, by reflecting them without Refraction; and that the Surfaces of White Bodies are Specular, and by a Change of the Texture of its Parts, a Body may be deprived of that Colour.

Blackneſs differs from White, in as much as the Rays of Light are reflected inwards, and not upon the Eye, the Pratuberant Parts yielding to the Impreſſion of thoſe Lucid Rays.

The Sixth and Seventh Chapters contains ſeveral Experiments, which prove, That Whiteneſs and Blackneſs may be Mechanically altered or produced.

CHAP.

CHAP. V.

SECT. I.

IN the First Chapter of the *Appendix* to the Fourth Book, he teaches, That Cold may be Mechanically produced or destroyed, by a bare Change of Texture, or Alterations otherwise Mechanically brought on, without the Assistance of the *Aristotelian* substantial Forms, or the Hypostatical Principles of the Chymists.

SECT. II.

Shews us, That not only Weather-Glasses but our Senses may misinform us about Cold, and the account of several Prediſpositions and the Temper of our Sensories; as we feel it colder in the Air, when we come out of a hot Bath, than when only out of a warm Room, *&c.*

SECT. III.

The Third Chapter contains Obſervations about the Deficiencies of Weather-Glasses, *&c.* which since they teach us only how to learn to improve the use of them, and since they cannot be expressed in fewer Words, I must take no farther notice of them.

SECT. IV.

Tells us, That the Cauſe of the Condenſation of the Air in Weather-Glaſſes, and the Aſcent of Water by Cold, depend on the Preſſure of the external Air gravitating upon the Surface of the Water without the Pipe, and over-powering the Spring of the Internal Air, weakened by Cold.

SECT. V.

The Fifth Chapter contains a Natural Hiſtory of Cold, which, ſince it will not admit of being otherwiſe related than Hiſtorically, I muſt refer the Reader to the *Epitomy*.

SECT. VI.

The Sixth Chapter contains a Confutation of the Received Notion of *Antiperiſtaſis*. The Seventh, an Examination of Mr. *Hobbe*'s Doctrine of *Cold*; which being only Controverſial, I muſt paſs it by. And as for the Eighth and Ninth Chapters, they likewiſe containing bare Hiſtorical Truths, which admit of no Contraction, and this ſmall General Recapitulation will not admit of Tranſcribing the whole *Epitomy*.

SECT.

SECT. VII.

The Tenth Chapter teaches us, that Cold is only a Privative Quality, depending on a Privation of the Motion of the Parts of a Body cooled.

SECT. VIII.

The Eleventh Chapter ſhews, That the Expanſive Force of freezing Water is ſo great, as to be able, when froze in a Braſs Cilinder, to raiſe 254 Pounds, tho' the Cilinder was none of the largeſt. And in the ſame Chapter we are likewiſe told, That a cold Ebullition, or (if one may ſo ſpeak) Effervescence, depends purely upon the Texture of the fermenting Liquor.

SECT. IX.

The Twelfth Chapter contains ſeveral Experiments, which prove, That Heat depends upon, and is cauſed by a variouſly determined and a rapid Motion of this minute Parts of the Body eſteemed hot.

SECT. X.

Contains an Account of a particular ſort of Mercury which grows hot with Gold.

SECT. XI.

From ſeveral Experiments made and contained in the Fourteenth Chapter, it appears, That the Particles of Fire may be detained in Metal, and by that means add to the Weight of it. And the Fifteenth Chapter contains Experiments which have the ſame Tendency.

SECT. XII.

The Sixteenth Chapter contains a Diſcovery of the Perviouſneſs of Glaſs to ponderable Parts of Flame; and alſo proves, That Flame may act as a Menſtruum, and make Coalitions with the Bodies it works upon.

SECT. XIII.

The Seventeenth Chapter contains new Experiments concerning the Relation betwixt Flame and Air, from which it appears, that it is very difficult to produce Flame without Air, and impoſſible to preſerve it.

SECT. XIV.

The Eighteenth Chapter contains Experiments about the Relation betwixt Air and the *Flamma* Vitals of Animals; from whence it appears,

appears, That it is as impoſſible to preſerve Animals without Air as Flame.

SECT. XV.

The Twentieth, Twenty firſt and ſecond Chapters, contain ſeveral Experiments which ſhew, That ſhining Fleſh and Fiſh, as well as Worms, ceaſe to become lucid, if deprived of the Contact of the Air.

SECT. XVI.

The Twenty third Chapter contains ſeveral Experiments made with a Diamond which ſhone in the Dark.

SECT. XVII.

The Twenty fourth and fifth Chapters give an Account of an Aerial and Icy *Noctiluca*, whoſe Lucidneſs depend on Fumes raiſed by the Saline Parts of the Air, which being united with the Air, affect the Eye jointly.

CHAP. V

SECT. I.

THE Five first Chapters of the Fifth Book, and the First Part, shew, That Bodies have only a Relative Levity under Water; That the Air, by virtue of its Spring, presses on Bodies under Water; and that the Effects of the Air on such Bodies vary according to the differing Weight of the *Atmosphere*; and likewise contain an Invention for estimating the Weight of Water in Water.

SECT. II.

The Sixth Chapter contains the following *Hydrostatical Paradoxes* made out by several Experiments.

I. That in Water, and other Fluids, the lower parts are pressed by the upper.

II. That a lighter Fluid may weigh upon a heavier.

III. That if a Body contiguous to the Water, be altogether or in part lower than the highest Level of the said Water, the lower part of the said Body will be pressed upwards by the Water that touches it beneath.

IV. That

IV. That in the Aſcenſion of Water in Pumps, *&c.* there needs nothing to raiſe the Water but a competent weight of an external Fluid.

V. That the Preſſure of an external Fluid is able to keep an Heterogeneous Liquor, ſuſpended at the ſame height in ſeveral Pipes, tho' thoſe Pipes be of very different Diameters.

VI. If a Body be placed under Water with its uppermoſt Surface parallel to the Horizon, how much ſoever Water there may be on this or that ſide above the Body, the direct Preſſure ſuſtained by the Body is no more than that of a Column of Water having the Horizontal Superficies of the Body for its Baſis, and the prependicular depth of the Water for its Heighth.

And ſo likewiſe

If the Water that leans upon the Body be contained in Pipes, open at both ends, the Preſſure of the Water is to be eſtimated by the weight of a Pillar of Water, whoſe Baſis is equal to the lower Orifice of a Pipe, and its heighth equal to a Perpendicular reaching thence to the top of the Water, tho' the Pipe be much inclined towards the Horizon, or tho' it be irregularly ſhaped, and much broader in ſome Parts than the ſaid Orifice.

VII. That a Body immerſed in a Fluid ſuſtains a lateral Preſſure from the Fluid; and that increaſes as the Depth of the immerſed Body below the Surface of the Fluid increaſes.

VIII. That Water may be made to depreſs a Body lighter than it ſelf, as well as to buoy it up.

IX. That a parcel of Oil, lighter than Water, may be kept in Water, without aſcending in it.

X. That the Cauſe of the Aſcent of Water in Syphons, and of flowing through them, may be explained without having recourſe to Nature's Abhorrency of a Vacuum.

XI. That a ſolid Body, as ponderous as any yet known, tho' near the top of the Water, will ſink by its own weight; yet if it be placed in a greater depth than that of Twenty times its own thickneſs, it will not ſink, if its Deſcent be not aſſiſted by the weight of incumbent Water.

SECT. III.

The Eighth Chapter contains a Deſcription of a new *Hydoſtratical* Inſtrument, to eſtimate the difference of Metals in goodneſs.

SECT.

SECT. IV.

The Ninth Chapter contains a ſhort Account of the Increaſe and Growth of Metals. And the remaining Chapters of the Firſt Part of the Fifth Books, lays down a Method to eſtimate the Goodneſs of Ores, and alſo of Medicinal Subſtances; by which it may eaſily appear, That if a Body be heavier than Chryſtal, it muſt contain more or leſs of a Metalline Ingredient, as it exceeds that in weight.

CHAP.

CHAP. VI.

SECT. I.

THE Second Part of the Fifth Book contains ſeveral ſolitary Obſervations and Experiments, both Chymical, Medicinal, and Phyſical; which, ſince nothing can be inferred from them, but what hath been already taught, it will be needleſs to mention what is contained therein, eſpecially ſince Hiſtorical Relations cannot be more contracted than in the *Epitomy*.

CHAP. VI.

SECT. I.

THE First and Second Chapters of the Third Part of the Fifth Book, teach, That all Gems have been once in a fluid Form, and that they receive their Virtues and Colours from Mineral Tinctures.

SECT. II.

The Second Chapter shews, That even solid Bodies continually emit Effluvia.

SECT. III

The Fourth Chapter shews the strange Subtlety of Effluvia; a Grain of Silver Wyre, consisting of 64800 true Metalline Parts, and a Grain of Leaf-Gold being capable of being divided into 2000000 Squares. And Fillings of Copper will give a Tincture to 613620 times their Bulk of Water.

SECT.

SECT. IV.

The Fifth Chapter ſhews the great Efficacy of Effluviums, as in Lightning; and other Effluviums which affect Humane Bodies.

SECT. V.

The Sixth Chapter proves, That the Effluviums of Bodies act according to the determinate Nature of the Body they come from.

SECT. VI.

The Seventh and Eighth Chapters ſhew, That not only Animal, but other ſolid Bodies are porous.

SECT. VII.

The Ninth and Tenth Chapters contain a Natural Hiſtory of Humane Blood; for which I muſt refer the Reader to the *Epitomy*, it not admitting of a Recapitulation of the Contents in much leſs room than they are there contained in.

SECT. VIII.

The laſt Chapter of the Third Volume ſhews, That the Operations of Specifick Medicines are

are Reconcilable to the Conpuſcular Philoſophy.

What he hath delivered concerning the manner of their acting, it may be comprized under the following Heads.

Prop. I. Sometimes a Specifick Medicine may cure by diſcuſſing or reſolving the Morbifick Matter, and thereby making it fit for Expulſion by the greater common-Shoars of the Body, and the Pores of the Skin.

Prop. II. Sometimes a Specifick Medicine may mortifie the over-acid, or other immoderate Particles that infect the Maſs of Blood, and deſtroy their Coagulatory, or other Effects.

Prop. III. Sometimes a Specifick Medicine may help the Patient, by precipitating the Morbifick Matter out of his Blood, or the other Liquors of the Body in which it harbours.

Prop. IV. Sometimes a Specifick Medicine may work by peculiarly ſtrengthening and cheriſhing the Heart, the Part affected, or both.

Proy. V. Sometimes a Specifick Medicine may act, by producing in the Maſs of Blood ſuch a Diſpoſition as may enable Nature, by correcting, expelling, or other fit Ways, to ſurmount the Morbifick Matter, or other Cauſe of the Diſeaſe.

Prop.

Prop. VI. Sometimes a Specifick Medicine may unite with the Morbifick Matter, and compoſe a *quid Nutrum*, which may be leſs offenſive to Nature, tho' not ſo eaſily expelled.

SECT. IX.

The Firſt Chapter of the Fourth Volume contains the Invitation of the uſe of Simple Medicines: Firſt, Becauſe their Effects may more eaſily be foreſeen than the Effects of a Compoſition, and therefore ſafer. Secondly, A greater Quantity of a good Medicine may be taken, without being offenſive. And, Thirdly, Becauſe the Effects of the *Materia Medica* may be ſooner brought to a Certainty. The Second Chapter contains Hiſtorical Obſervations about Vitiated Sight.

CHAP.

CHAP. VII.

SECT. I.

THE First Chapter of the Fourth Book contains the Author's Chymical Works, in which it is made to appear, that Chymical Principles are tranſmutable; That a Subſtance looked upon to be Homogenious, and a Chymical Principle, may afford very differing Subſtances, when acted on by the Fire; That Fire is not the True and Genuine Analizer of Bodies; That the Pipe does not ſeparate the Principles of a Body, but variouſly compound and alter the Texture of Body a expoſed to its Action; That Bodies obtained from Subſtances expoſed to the Fire, were not pre-exiſtent in thoſe Subſtances in the ſame Form.

SECT. II.

The Second Chapter ſhews the Inſufficiency of the Arguments uſed by the Chymiſts and *Ariſtotelians*, in favour of their Doctrine; and the remaining part of the Fifth Book in General ſhews, that Chymical Principles are producible, and depend on a Mechanical Structure and Texture of Parts.

And farther, That the differing Subſtances into which Bodies may be divided by Fire, are not of a pure and elementary Nature; nor is theirs

their Number either precisely 3 or 5. And, lastly, That there are divers Qualities which cannot be referred to any of these Substances.

SECT. III.

And in one of the Chapters belonging to the Fourth Part of the Fifth Book, he considers and confutes the Doctrine of *Acids* and *Alkali*, shewing the Insufficiency of that Doctrine.

SECT. IV

The Sixth Book, which makes up the Remaining Part of the *Epitomy*, contains an Abstract of some of his *Physiological Essays* of the Usefulness of *Experimental Philosophy*: But it is impossible to give any shorter Account of them than what is contained in the *Epitomy*.

General Heads

FOR THE

Natural HISTORY

OF A

COUNTRY.

CONsidering the great Improvements that have been made in Natural Hiſtory by the Travels of Gentlemen, Seamen, and Others; And the great Diſadvantage many Ingenious Men are at in their Travels, becauſe they know not before-hand what things they are to inform themſelves of in every Country they come to, or by what Method they may make Enquiries about Things to be known there, I thought it would not be unacceptable to ſuch, to have Directions in General, relating to Particular Countries, in as little Bounds as poſſible, preſented to their View.

As for the General Heads, I ſhall offer them to your Conſideration in the following Order,

viz. As they reſpect the Heavens, or concern the Air, the Water, or the Earth.

Firſt. Under the firſt kind may be reckon'd the Longitude and Latitude of the Place, and that in reſpect to the Changes made in the Air; the Climate, together with the Length of the longeſt and ſhorteſt Days, and the Parallels come here to be conſidered; the Retrogradation of the Sun upon Dials, within the Tropicks, and that naturally; what fix'd Stars, and what not ſeen there, *&c.*

Secondly, The Temperature of the Air is to be conſidered, as to Heat, Drineſs and Moiſture, and the Meaſures of them, its Weight, Clearneſs, Refractive Power, its Subtilty or Groſneſs, its abounding with, or wanting an Eſurine Salt; its Variation according to the ſeveral Seaſons of the Year, and the Times of the Day: How long the ſeveral kinds of Weather continue, what ſort of Meteors it breeds moſt commonly; in what Order they are generated, and how long they uſually laſt: Eſpecially what Winds 'tis liable to; whether any of them be ſtated, and ordinary, *&c.* What other Diſeaſes are Epidemical, that are ſuppos'd to flow from the Air: What other Diſeaſes the Country is ſubject to, wherein that had a ſhare, *e.g.* the Plague and contagious Sickneſſes: What is the uſual Salubrity or Inſalubrity of the Air: And with what Conſtitution it agrees better or worſe than others. As alſo the Specifick Gravity of the Air, compar'd with the other foregoing Qualities: For this Effect it will be convenient the

the Traveller be provided with a Travelling-Baroscope, having the Divisions usual in the other Baroscopes, mark'd upon a sliding Ruler, which being once exactly mark'd for *London*, may serve for other Places; and for observing the Difference between the Air here and in other Places, and in most differing Climates, as in the Torrid and Frigid Zone, it has another Ruler coming out perpendicular from the lower end of the Sliding-Ruler, that it may mark the heighth of the *Mercury* in the lower Leg of the *Syphon*; so the Divisions of the upper end will shew you the Specifick Gravity of the Air at that time.

Thirdly, About the Water are to be considered: 1. The Sea, its Depth, specifick Gravity, Difference of Saltness in different Zones, the Plants, Insects, and Fishes to be found in it, Tides, with respect to the adjacent Lands, Currents, Whirl-pools, *&c.* 2. Rivers, their Bigness, their Course, their Inundations, their Saltish Taste, as they report observable in *Jordan*, Subterraneous Passages, Fruitfulness of their Waters, *&c.* Their Lakes, as that of *Schernitzer* in *Carniola*, Ponds, Springs, and especially Mineral Waters, what sorts of Earth they run through, their Kinds, Qualities, and Vertues, and how examin'd; the sorts of Fishes, their Bigness and Goodness, compared with the Ground at the bottom, their Plenty, their Seasons, their ways of Breeding, their Haunts, and the ways of Taking them, especially those that are not purely Mechanical.

Fourthly, In the Earth may be obſerved,

I. It Self.

II. Its Inhabitants, and its Productions, and thoſe Internal or External.

I. As to its Self: What are its Dimenſions, Situation, Eaſt, Weſt, South, or North; its Figure, its Plains, Hills or Valleys, their Extent, the Heighth of the Hills, either in reſpect of the neighbouring Valleys, or the Level of the Sea; as alſo whether the Mountains lie ſcatter'd or in Ridges, and whether thoſe run North or South, Eaſt or Weſt, *&c.* What Promontories, Fiery or Smoaking Hills, *&c.* the Country has or hath not; whether ſubject to Earthquakes or not. Whether the Country is coherent, or much broken into Iſlands. What Declination the Magnet has in ſeveral Places at the ſame Time, and how much it varies in diferent Times at the ſame Place: Whether before the *Turnados* or *Hurricanes*, the Magnetical Needle loſes its Direction towards the North, and turns to all the Points of the Compaſs; and if this Declination is influenced by Subterraneous Fire, deſtroying it within, or by Water overflowing the Surface of it, or by its Vicinity to Iron Mines. What kinds of Soils are there, whether of Clay, Sand, Gravel, *&c.* What are its Products, as to Minerals, Vegetables or Animals: And moreover, how all theſe are or may be farther improved for the Benefit of Man, what are the Qualities of that Soil peculiar to it.

II. The

II. The Inhabitants themſelves are to be conſider'd, both Natives and Strangers, that have been long ſettled there; particularly their Stature, Shape, Features, Strength, Ingenuity, Diet, Inclination, that ſeem not due to Education. As to their Women, their Fruitfulneſs or Barrenneſs, their eaſie and hard Labour, with their Exerciſes and Diet; the Diſeaſes both Men and Women are ſubject to, peculiar to themſelves, compared with their Diet, Air, *&c.* that do influence them.

The Products External are Plants, Trees, Fruits, *&c.* with the Peculiarities obſervable in them (*e. g.* that of the Poiſon-wood, call'd *Machenil* in *New-England*, with its Cures) and what Soils they thrive beſt in. What Animals, Terreſtrial or Volatile, or Inſects of all ſorts they produce, and to what uſe applied by the Inhabitants, as to Meat, Phyſick, Surgery, or Dying, *&c.*

By the Internal Production of the Earth are to be underſtood here, Things procreated in the Bowels of the Earth, either for the Benefit or Hurt of Man; where Notice is to be taken what way the one may be beſt found out, and the other moſt eaſily avoided or cured. Under theſe are comprehended Metals, Minerals, Stones Precious or Common, and how theſe Beds lie in reference to North or South, *&c.* What Clays and Earths it affords, *e. g* Tobacco pipe-Clay, Marles, Boles, with their Phyſical or other Uſes, Fullers Earth, Earth for Potters Ware, Soap, Earths, Axungiæ, *&c.* What Coals, Salts, or

Salt-Mines, as Allom, Vitriols, Sulphures, *&c.* it yields. As for Mines, you are to consider their Number, Situations, Depths, Signs, Waters, Damps, Quantities of Ore, extraneous things, and ways of reducing their Ores into Metals, *&c.* Where, by the way, you may inform your selves of the Truth of what is reported by *Agricola*, *Kircher*, &c. of Apparitions, and their Operations under Ground.

To these General Articles of Enquiries (saith their Proposer) should be added Enquiries about Traditions, concerning all particular things relating to that Country, as either peculiar to it, or at least uncommon elsewhere.

II. Enquiries that require Learning or Skill in the Answerer; to which should be subjoin'd, Proposals of Ways to enable Men to give Answers to these more difficult Enquiries.

After the General Heads now propos'd, we shall mention those that concern Navigators into Remote Places.

The First agrees with what has been said before, *viz.* The Observing the Declination of the Compass, in the different Longitudes and Latitudes the Ship comes to, and setting down the Method by which the Observation was made.

2. To take notice of the Dipping-Needles, and their Observations in the like manner.

3. To

3. To obſerve the Odours, Colours, Taſtes in Sea-water, and what are the Particularities of that Sea-Water, where Ships do ſooneſt rot, as in the Streights of *California* the Sea looks red, with innumerable Worms that are in it.

4. To remark, if (as is reported by *Kircher*) there be near the South Pole a conſtant Current, ſetting from the South, ſo forcibly, that Ships with a ſtiff Gale are hardly carried up againſt it; and near the North a Current forcibly carrying Ships towards the Pole, or if this Motion reciprocate once in half a Year.

5. To obſerve what ſubterraneous Paſſages there are, whereby Seas communicate with one another, as the *Caſpian* is ſuppoſed to do with the *Black Sea*; and the *Dead Sea* with the *Red Sea*.

6. To examine the Map made of the Straits by Captain *Bolland*, and the Account of the Tides he there gives.

7. The Effect the Winds have upon the Seas, and how far down from the Surface they agitate the Waters.

8. To take notice of the Tides, of the Ebbings and Flowings, with the Age of the Moon when the Neap and Spring-Tides do happen, to what heighth it does ebb and flow at theſe Times upon the Coaſt of the *Terra Firma*, or upon the Iſlands far off in the Sea, as at St. *He-*

lena, and if it flow there with difference from the Tides near the main Land, and how much ſooner it begins at one ſide than another.

9. To take notice of the Coaſt, and to make narrowly the way of coming into particular Creeks and Harbours, with their Bearings and Diſtances from the neighbouring Places, as you come in.

10. Not forgetting at the ſame time to ſound all along as you come in, and to mark the Depths and Shallows near the Shoar, or farther off from the Coaſt, near Shelves or Banks, and whether it increaſes or decreaſes in any Order.

11. To mark in the Sounding all Grounds, whether Clayie, Sandy or Ouſie, *&c.*

12. To take Notice of the Winds, their Changes, or ſet Times of Blowing, and in what Longitude and Latitude, eſpecially the Trade-Winds; upon what Coaſt the Trade-Winds are moſt frequent, and by what Signs they may be foreſeen.

13. To Obſerve and Record all extraordinary Meteors, Lightnings, Thunders, and their Effects, *Ignes Fatui*, Comets, *&c.* marking the Places of their Appearing and Diſappearing.

14. To be provided with a nice pair of Scales, and exact Weights, for examining the Weights of the ſeveral Waters that occur, which I think may be moſt exactly done after the

the Method proposed by the Incomparable Mr. *Boyle*, in his *Medicina Hydrostatica*, *viz.* weighing a Viol close stopp'd with a Glass Stopper first in the Air, then in Liquor: If the Vial be about two Ounces in the Air it will do the better: For the whole Method, because 'tis too long to insert into the Tract, I refer you to the Book it self. This I propose as the most subtile and accurate. If you like a plainer way, you may use the Method practised by the Noble Author elsewhere, *viz.* To fill a Glass Vial of four Ounces or more, with a small Neck, full of the Water to be try'd, and to examine the Weight of it, which you may compare with another.

15. 'Twill be convenient both for the Navigator and Philosopher, to be provided with an Instrument for fetching up Water from the Bottom of the Sea, first publish'd by the Ingenious Mr. *Hooke*, and transferr'd hither for the Benefit of the Curious Traveller; for by this he may know whether the Water at the Bottom be heavier and salter than at the Top; or whether there be fresh Water at the Bottom, occasion'd by Springs of fresh Water there, as some presume there are, having observ'd in some Places Springs of fresh Water a great way within the Sea-marks. The Contrivance is this: A Wooden Bucket is fastened to an Iron Rod, with a Weight to sink it; this Bucket is shut at top and bottom with two Valves or Clacks, so contriv'd, that when it descends, it may open and let the Water pass through; but when 'tis pull'd up again from the Bottom, it may shut so

ſo cloſe as to keep in all the Water it has at that time, by the under Valve, and the ambient Water over it, from getting in by the upper Valve.

Having gone through the General Directions both for Sea and Land, we come to more Particular ones, and ſhall begin firſt with thoſe that concern Mines; the Knowledge of which, tho' it began very early, and has been continu'd to our Times, yet is ſtill found improveable by Humane Induſtry, as Experience has taught us, and therefore worthy to be conſider'd in the next Place, eſpecially ſeeing the Arts and Inventions moſt uſeful for Man's Life, depend more upon this than any other; and that without it, the World ſhould want little of returning to its former Barbarity. All ſhall be reduced to Six General Heads, as has been done by the worthy Patron of Ingenious Arts, the Honourable *Robert Boyle*, now in Glory.

The Firſt, The Neighbouring Country about the Mines.

The Second, The Soil where the Mines are.

The Third, The Sign of Mines.

The Fourth, The Structure, and other Particulars relating to the Mines themſelves.

The Fifth, The Nature and Circumſtances of the Ore.

The

The Sixth, The Reduction of the Ore into Metal.

QUERIES about the First Title.

I. Whether the Country be Mountainous, Plain, or distinguish'd with Valleys? And in case it be Mountainous, what kind of Hills they are, whether high or low, or indifferently elevated? whether almost equal, or very unequal in heighth? whether Fruitful or Barren, Cold or Temperate; Rocky or not; Hollow or Solid? whether they run in Ridges, or seem confusedly plac'd; and if the former, what way the Ridges run, *North* or *South*, &c.? And whether they run any thing parallel to one another?

II. What the Country produces, and what is most plenty?

III. What Cattle it produces? whether they have any thing peculiar in point of Bigness, Colour, Longevity, Fitness or Unfitness to make good Meat, and other Things, which may rather be attributed to the peculiar Nature of the Place, than the Barrenness of the Soil, or other manifest Causes?

IV. What Health the Inhabitants enjoy? what Diseases they are subject to, and to what not? for 'tis said, that such as dwell near Quicksilver Mines are seldom troubled with the Plague: And

And lastly, what Remedies are found for the Epidemick Diseases of the Place?

V. What plenty of Rivers, Brooks, Lakes, Springs, *&c.* in these, and how these are in Colour, Taste, *&c.* and how they affect the Health of those that use them?

N. B. Mr. *Boyle* says somewhere, That a Reddish Mineral Water has been drunk to satisfie Thirst, without any Hurt.

VI. How the Air is disposed, as to Heat or Cold, Calms or Winds; and whether these Winds do proceed from, or are infected with Subterraneous Steams? whether Clear or Foggy?

About the Second Title.

VII. Whether the Soil that is near the Surface of the Earth be stony; and if so, what sort of Stones it abounds with, whether it be Clayie, Marly, or Chalky? and of how many kinds this is, and by what Properties they are distinguish'd?

About the Third Title.

VIII. By what Signs they conjecture a Mine to be in a Place?

IX. And seeing these Signs are either above or beneath the Surface of the Earth, *Quær.* Whether

ther the Ground be barren where these Metal Mines are?

X. What Trees or Plants do most plentifully grow in these Places, and do thrive well or ill in these Places? whether they be more dwarfish, more discolour'd in the Leaves, or have any preternatural Colour in them?

XI. What Alteration is produc'd in the Waters that run from them, either as to their Colour, Taste, Smell, Ponderousness, or the Matter that they leave upon the Stones they run over.

XII. Whether Snow or Ice continue as long in these Places as they do in the neighbouring Places?

XIII. Whether the Dew that falls on the Ground will discolour a white Linnen Cloth, spread on the Surface of the Earth? and whether the Rain brought thither from other Places will discolour such Cloaths, or afford any Residence of a Mineral Nature?

XIV. Whether Thunder, Lightnings and Storms do abound there? and if there be any Fiery Meteors and Nocturnal Lights observed there?

XV. Whether Mists do arise from such Mineral Grounds; what is observable in them; what Minerals they signifie, and may be suppos'd to be produc'd by?

XVI. Whe-

XVI. Whether the *Virgula Divinatoria* be us'd for the finding out the Mines, and with what Succeſs.

As for thoſe Signs that are beneath the Surface.

XVII. *Quær.* Whether there be any Clays, Marles, or other Mineral Earths, and of what Conſiſtence they are that give Notice of the Ores; and if there be more than one, and at what Depth they lie, in reſpect of one another, and how thick they are.

XVIII. What Stones, Marcaſites, *&c.* there are to be found near or not far from the Surface, which give Signs of thoſe Mines, as it happens in the Tin-Mines of *Cornwal*, where Marcaſites are often found above the Ore; what is the particular Shapes, Bigneſs, Colour and Weight of ſuch Stones, whereby they are diſtinguiſhable from others.

XIX. Whether Heat or Damps are a Sign of a Mine.

XX. Whether Water found in Digging be a Sign of a Mine.

XXI. By what Signs the Nearneſs of a Mine is known; and whether by any Sign one may know whether he is above, beneath, or at the ſide of the Mine.

XXII. By

XXII. By what Signs the determinate Kinds of Metals are known, with their Plenty or Goodneſs.

XXIII. What Signs there are of the Depth of the Mines; what Signs there are of the Mines being hopeleſs, or at leaſt unlikely, to find a Vein in the Place where 'tis digged for, and what theſe are.

About the Fourth Title.

XXIV. What is the Depth of the Shaft or Groove, till you come at the Vein or Ore; whether the Vein run or lie horizontal or dip; and if it dip, what Inclination it hath, how deep the loweſt part lies, and conſequently how much deeper than the uppermoſt.

XXV. As alſo what its Flexures, if it have any, are; and whether it runs directly North or South, Eaſt or Weſt, or ſeem rather to have a caſual Tendency than any Determination by Nature, and how far it reaches in all.

XXVI. What is the wideneſs of the Groove at the top and elſewhere; whether the Groove be perpendicular or crooked, and if crooked, after what manner, and with what Diſtance it winds.

XXVII. How the Groove is ſupported; what are the kinds, length, bigneſs, and way of placing

cing the Timber, Poles, *&c.* that are imploy'd to ſupport it; and how long the Wood laſts, without being ſpoil'd by the Subterraneous Fumes and Waters, and what Wood laſts longeſt.

XXVIII. What Air-ſhaft belongs to the Mine; whether it be ſingle or more than one; of what Breadth the Air-ſhaft is at the Oriſice; whether it be convenient enough or not; how near 'tis plac'd to the Groove, and in what Poſition; if there be ſeveral Air-ſhafts, what their Diſtances and Situation are, in reference to the Groove, and to each other; and how Air is ſupply'd, if there be no Air-ſhafts.

XXIX. Whether they meet with Waters, and what Plenty there is of them; at what Depth they are found, and how qualified, and what way they ſpring, *&c.*

XXX. Whether they are conſtant or temporary; whether they increaſe or diminiſh notably in *Summer*, or at any time of the Year; and what that Seaſon is, how long it laſts, and the Proportions of Increaſe and Decreaſe.

XXXI. What Engines or Contrivances are made uſe of for drawing up the Water, and conveying it away, the Materials they are made of, the Parts, the Bigneſs, the Coaptation, and in ſhort the whole Structure, number and way of applying the Inſtruments that are made uſe of to free the Mines from the Water.

XXXII.

XXXII. What are the Conditions, Number, *&c.* of the Adits.

XXXIII. Whether the Mines be troubled with Damps, and of what kind they are; whether they come often or seldom at any Time of the Year, or altogether irregularly.

XXXIV. What Signs forerun them; what Mischief they do; what Remedies are the most successfully employed against them, as well in reference to the Clearing of the Mine, as to the Preservation and Recovery of the Men.

XXXV. What Methods the Mine-men use in following of the Vein, and tracing their Passages under Ground (which they call Plumming and Dyalling) according to the several Exigencies; and whether they imploy the Instruments made with the Help of the Loadstone, the same way that is usual; and, if not, wherein they differ in the Use of the same Instruments; and what Instrument they substitute in their place.

XXXVI. What ways they secure themselves against the Uncertainty that the Magnetical Needle is subject to when it comes near to Iron Ore, of which yet perhaps there is not so great Danger as one may imagine, as far as I could find by a Trial purposely made by a Groove, where I was sure there wanted not Iron Ore;) and what other ways may be used, besides a Load-stone, to help a Miner.

XXXVII. How the Miners deal with the Rock and Spar they meet with before they come at the Ore; and how they use Fire to soften, calcine, or crack them; with what Success they imploy it.

XXXVIII. By what means they free the Mines and the Workmen from the Inconveniences arising from the much use of the Fire.

XXXIX. With what Instruments they break the Rock, how long they are used, and how long they last.

XL. How the Miners work, whether cloathed or naked, and what Lights they use to work by; what Materials they are made of, and what Light they give; how long they last, and by what ways they are kept burning in that thick and foggy Air.

XLI. How Veins are followed, lost, and recover'd; and how several Miners work on the same Vein, and what is the best way of getting all the Ore in a Vein, and most conveniently.

XLII. How they convey out their Ore, and other Things that are to be carried out of the Mine; whether they do it in Baskets drawn up by Ropes, or upon Mens Backs; and if this last kind of way, what kind of Vessels they use for Matter, Shape and Capacity, and whether the Workmen deliver them one to another, or the same Workmen carry them all the way; and whether

whether they descend and ascend by Ladders of Wood or Ropes, *&c.*

About the Fifth Title.

XLIII. Whether the Ore runs in a Vein, or lie dispers'd in scatter'd Pieces, or be divided partly into a Vein, partly into loose Masses, or like a Wall between two Rocks, as it were in a Cleft, or be interspers'd in the firm Rock, like speckled Marble, or be found in Grains like Sand or Gravel, as store of excellent Tin is said to be found in some Parts of *Cornwal*, at the Sides and in the Channels of Running Waters, which they call ——— or whether the Ore be in a softer Consistence, like Earth or Lome, as there is Lead Ore in *Ireland*, holding store of Silver and Iron Ore in the North Parts of *Scotland*, and elsewhere, and what is observable in it, as to Weight, Colour, Mixture, *&c.*

XLIV. Whether any part of the Metal be found in the Mine perfect and compleat (as I have had presented me good valuable Copper, and pieces of perfect Lead, that were taken up, the one at *Jamaica*, and the other by an Acquaintance of mine, that took them out of the Ground himself, in *New-England*.)

XLV. Whether the Mine affords any parcels of Metal that ſeem to grow like Plants, (as I have ſometimes ſeen Silver grow, as it ſeemed, out of Stone or Spar; almoſt like Blades of Graſs, as alſo great Grains of Metal, which appear'd to me, and which thoſe that try'd ſome of it, affirm'd to be Gold, abounding in a ſtony Lump, that ſeem'd chiefly to conſiſt of a peculiar kind of Spar.

XLVI. Whether the Vein lie near the Surface of the Earth, and at what Depth; whether the Vein have not any peculiar concomitant Coats, (if I may ſo call them,) and if any, what they are, and in what Order they lie, as the Veins of Lead Ore with us have frequently annexed to them a Subſtance called Spar, and next to that another call'd Caulk.

Whether (beſides theſe Coats) they have belonging to it any other Heterogeneous Subſtance, (as in Tin-Mines we often find that yellow Subſtance they call Mundick)

XLVII. What are the principal Qualities of theſe extraneous Subſtances, (as that Spar is white, but almoſt tranſparent, like courſe Cryſtal, heavy, brittle, eaſily diviſible into Flakes, &c. Caulk is of a different Texture, white, opacous, and like a Stone, but much more ponderous. Mundick I have had of a fine golden Colour; but tho' it be affirm'd to hold no Metal, yet I found it in weight and otherwiſe to differ from

from Marcasites, and the Mine-men think it of a poisonous Nature.

XLVIII. Whether the Vein be inclos'd every way in its Coats, or whether it lie only between them.

XLIX. Whether the Vein be every way of an uniform Breadth and Thickness; and if it be, what these Dimensions are; and if not, in what Places it varies, and in what Measures; (the like Questions are to be made concerning the Spar, Caulk, and other Mixtures of the Ore.)

L. Whether the Vein be uninterrupted, or in some Places broken off; and whether it be abruptly or not; and whether it be by Vales, Brooks or Gullets, *&c.*

LI. How wide the Interruptions are; by what Signs the Veins are to be found again; whether the ulterior part or division of the Vein be of the same nature and hold on in the same course, as to its tendency upwards and downwards, or horizontally, Northward or Southward, *&c.* with the Vein from which 'tis cut off.

LII. Whether in case the last end of the Vein be found, it terminate abruptly, or else end in some kind of Rock or Earth, which does as it were close or seal it up, without leaving any Crack or Cranny, or otherwise; and whether the terminating part of the Vein tends either upward or downwards, or neither. Or whe-

ther in the Places where the Vein is interrupted, there be any peculiar Stone or Earth that does, as it were, ſeal up the Extremity of it.

LIII. Whether it be obſerv'd that the Ore in Tract of Time may afford any Gold or Silver, which it doth not afford, or more than it would afford if it were not ſo ripe; and whether or not it have been found that the metalline part of the Vein grows ſo, that ſome part of the Ore will afford Ore or Metal in Tract of Time, that did not ſo before; and whether to this Maturation of the Mine, the being expoſed to the free Air be neceſſary; or whether at leaſt it conduce to the acceleration of it, or otherwiſe.

LIV. Whether all the Ore contain'd in the Mine be of the ſelf-ſame Nature and Goodneſs, and if not, what are the differing kinds, and how to be diſcriminated and eſtimated.

LV. What is the Fineneſs and Goodneſs, by which the Mine is wont to be eſtimated. And,

LVI. What are the Marks and Characters that diſtinguiſh one ſort from another.

LVII. What Proportion of Metal it affords; (as in our Iron Mines is obſerv'd, that about three Tons of Iron Stone will afford one Ton of Metal: And I have had Lead Ore, which an Ingenious Man, to whom I recommended ſuch Trials, affirmed to me to afford three parts in four of good Lead)

LVIII.

LVIII. Whether the Ore be pure in its kind from other Metals; and if not, of what Metals it participates, and in what Proportion, which is eſpecially to be enquir'd into, eſpecially if the Mine be of a baſe Metal, that holds a noble Metal, (as I have known it obſerv'd, That Lead Ore, that is poor in its own Metal, affords more Silver than other; and I remember, that the Ore lately mentioned, being rich in Lead, ſcarce afforded us, being cupell'd) an Atome of Silver. And *Matheſius* informs us, That a little Gold is not unfrequently found in Iron Ore: And I have by me ſome fine Gold that never endur'd the Fire, taken out of Tin Ore.

About the Sixth Title.

LIX. What Preparations are us'd before the melting of the Ore, as Beating, Grinding, Waſhing, Toſting, or Parting, as is moſt frequently us'd in Copper Ore, and ſometimes in Iron Ore; if they uſe this Burning more than once, how often they do it, (for Copper Ore is in ſome Places waſh'd eight or ten times, and in other twelve or fourteen,) and with what Circumſtances, as how long the Ignition laſts at a time; whether the Ore be ſuffer'd to cool of it ſelf, or be quenched; whether it be waſh'd betwixt each Ignition; or whether the Ore requires no ſuch Preparations, as it often happens in Lead Ore, and ſometimes in Iron.

LX. Whether *Mercury* is made uſe of in ſeparating the Nobler from the Baſer Metals, (as in *Peru*, &c.

LXI. Whether (as I have ſeen done in Iron Stone) the Ore be expos'd to the Air, as a Preparative.

LXII. What Flux-Powders they uſe for reducing their Ores in ſmall Quantities.

LXIII. Whether in reducing or melting great Quantities they uſe any Addition of Flux-powder, (or *Fondant*, as the *French* term it,) or only by the Force of the Fire, or in any way between both, (as throwing in of Charcoals when they melt Iron Stone, does not only ſerve to feed the Fire, but by the *Alkali* of the Aſhes to promote the Fuſion: So Lime-ſtone, *&c.*) What is the Contrivance of the Furnaces, and if they be all of one ſort or bigneſs, or differing; what Tools are uſed in Smelting, and how contriv'd.

LXIV. What Fewel they uſe, and how much is ſpent in a Day or Week, and what Returns they have in Metal, in a proportionate Time.

LXV. Whether the Ore be melted in a Wind Furnace, made by the Fire's own Motion, or by Bellows; what their Dimenſions are, and what way us'd.

LXVI.

LXVI. What way they take or let out the Metal that is in Fuſion, to caſt it into Bars, Sows, Pigs; and what Clay, Sand, or Mould they let it run or pour it through; and after what manner they refrigerate it.

LXVII. Whether or not, to facilitate the Fuſion, they mix ſeveral Ores of the ſame ſort together, (as in ſome Places 'tis uſual to mix rich and poor Ore, and at *Mendip* they mix two or more of theſe differing kinds of Lead Ores, that they call Firm Ore, Steel Ore, Pottern Ore, *&c.*)

LXVIII. Whether or not, after 'tis once melted, they melt it again, to make it more pure; and if ſo, with what Circumſtances they perform it.

LXIX. Whether they have Signs to know when the Fuſion is well or ill perform'd, and the Metal have obtain'd a Perfection requiſite in ſuch a Fuſion, and in ſuch a Furnace.

LXX. Whether they obſerve any difference in the Goodneſs of the Metal that comes firſt, from that which comes laſt; and whether the Rule holds conſtantly, (for though they obſerve in the Tin Mines, that the beſt Metal comes firſt, yet an induſtrious Friend of mine informs me, that the beſt Metal comes laſt.)

LXXI.

LXXI. Whether the produc'd Metal be all of the ſame Goodneſs; and if it be, how good it is in reference to the Metals of other Mines, or other Parts of the ſame Vein; and if it be not, what difference are between the produced Portions of Metal, and what diſparity that amounts to in the Price.

LXXII. What are the ways of diſtinguiſhing them, and eſtimating their Goodneſs.

LXXIII. Whether there be not elevated Flowers to the upper parts of the Chimney, and whether they are barely Excrementitious or Metalline; (as in the *Corniſh* Tin Mines, after ſome Years they pull down the Thatched Houſes, in which the Ore has been melted, to get the Stuff that adheres to the inſides of the Roof, out of which they melt ſtore of excellent Tin.)

LXXIV. Whether, when the Ores are brought to Fuſion, they have any Recrements, (as Iron Stone affords ſtore of a dark Glaſs or Slag, the like does Tin; and if it do, what theſe Recrements are, and how to be ſeparated from the baſer Metal)

LXXV. Whether after the Metal has been melted, the remaining part of the Ore will in Tract of Time be impregnated with more Metal; (for this is affirm'd to me of the *Corniſh* Tin-Ore; and what remain'd after the Fuſion of the Iron Ore in the Foreſt of *Dean*, is ſo rich in Metal, that a Tenant of mine in *Ireland*, though

though he had on the Land he held for me an Iron Mine, found it less profit to work it, than to send to the Forest of *Dean* for this already us'd Ore, which having lain for some Ages since it was thrown aside, in great Heaps, expos'd to the Air, he affirm'd to yield a very great store of Iron and very good; though I somewhat doubt.

LXXVI. Whether this be totally to be ascrib'd to the Air, and length of Time, or to the leaving of Metal in the Slags in old Times, before great Furnaces were in use.)

LXXVII. Whether the Air appears really to be cold in *Summer*, and hot in *Winter*, by more evident Truths than the Testimony of our Touch.

LXXVIII. Whether they find the Stones and Ground actually hot, so that sometimes they can hardly stand upon the Place, as *Glauber* says, and from whence that proceeds.

LXXIX. Whether there be Mineral Juices that harden into Stones or Metals, upon the Touch of the Air called *Gur*; of this *Helmont* relates an Observation.

LXXX. What Laws, Constitutions and OEconomy is observ'd among the Miners.

LXXXI.

LXXXI. What way the Trees and their Leaves are affected by the Mineral Fumes and Juices, and if they be gilded or ſilver'd as along the River *Meine* in *Germany* is obſerv'd; and if theſe Trees be more ponderous than others; if they have any Metals or Metaline Concretes lodg'd in their Pores.

LXXXII. Whether there be Waters and Springs obſerv'd to riſe near the Mines, and run their whole Courſe under the Ground, without ever appearing above it.

LXXXIII. Whether Subterraneous Springs do riſe with any Wind, or determinate Change of Weather.

LXXXIV. How much heavier the Atmoſphere is at the Bottom than the Top; and whether Damps conſiderably increaſe the Weight of it.

LXXXV. Whether they find any ſtrange Subſtances in the Mines, as Veſſels, Anchors, Fiſhes inclos'd in Spar or Metal.

Having gone through what belongs to the Mineral Kingdom, in as full a Method as we could, the next Head of Enquiries ſhall be about the Vegetable Kingdom, which though more proper for one that has his Abode fix'd, may yet be acceptable and uſeful alſo to the curious Traveller.

I. What

I. What Vegetables there are which, having the wrong end of them ſet down into the Ground, will yet grow, as 'tis ſaid Elders and Briars will.

II. Whether the Branch of a Plant (as of a Vine or Bramble) being laid into the Ground, whilſt yet growing on the Tree, and there taking Root, being cut off from the Tree whilſt ſo growing, will ſhoot out forward and backward.

III. In Tapping, Cutting or Boring of any Tree, whether the Juice that vents at it comes from above or below.

IV. What part of the Juice aſcends or deſcends by the Bark; whether what ſo aſcends, aſcends by the outward or inward part of it.

V. Whether if a Zone of about two or three Inches be cut off about the bottom of a Branch, that Branch will die or caſt its Leaves, or bleed out a Juice from the upper or lower part of the Bark ſo cut, or be apt to ſhoot out Leaves or Branches, or Knobs, either above or below that boring.

VI. What the uſe of the Pith is; whether the Juice aſcend or deſcend by it; and what Effects will follow, if the Trunk be bor'd to the Pith, and a Peg droven hard into the Hole of the Pith, both above and below; this to be tried in the moſt pithy Plants.

VII.

VII. Whether the Points or Ends of the Roots being cut off, will bleed as copiouſly as Branches of the Trunks do, when bor'd.

VIII. What ſide of the Tree affords moſt Sap.

IX. Of what Age Trees afford moſt Sap.

X. What are the beſt Seaſons of the Air for taking the Sap of every kind of Tree in greateſt Quantity, and how long that Seaſon laſteth.

XI. Whether the Sap comes more copiouſly at one Time of the Day or Night than at another.

XII. Whether Trees afford any conſiderable Juice in the Fall.

XIII. What Effect, Copiouſneſs, or Scarcity of Rain hath upon the Saps of Trees.

XIV. Whether or no the Nature of a Tree may be changed by Applications of Juices or Liquors to the Roots, or other Parts.

XV. Whether a Tree, whoſe Root is covered from Rain, and not watered, if the Branches of it be expoſed to the Air, will grow.

XVI. Whether inoculated Roots of a Tree will grow.

XVII.

XVII. How ſhort the Arms of the Roots of a Tree may be cut, and the Tree ſtill grow.

XVIII. How deep the ſeveral kinds of Trees are to be ſet in the Ground to grow.

XIX. Whether or no, a Seed being planted either way, it will grow equally.

XX. Whether the Stem of a Tree being ſet in the Earth, and the Root turn'd up into the Air, the Tree will grow, *&c.*

Enquiries

Enquiries concerning the Uſe and Culture of the Kitchen-Garden and Winter-Greens.

I. What { Roots, Firſt Shoots, Sprouts, Stalks, Buds, Flowers, Fruits, Kernels, Seeds } to { Eat Raw, Boil, Roſte, Bake, Pickle, Preſerve, Candy, Dry whole, Dry to Powder, ſerving for Spice, make Wine, ——Cyder, ——Perry, ——Ale and other various Drinks, ——Vinegar & Verjuice, ——Thick Juices like Honey, ——Concrete Juices like Sugar, ——Bread, ——Cakes, Puddings & bak'd Meats, ——Broths, give pleaſant Colours to Meats and Drinks, what Herbs are fit to make Sallads, and how to be order'd for that purpoſe.

II. The

II. The beſt Seaſon to ſow every ſort of Seed.

III. How often every ſort of Seed ought to be ſown for the Uſe of the Kitchen-Garden.

IV. How the Earth is compounded and ordered for ſeveral kinds of Seeds and Plants.

V. What to be ſow'd on Cold Grounds.

VI. What to be ſow'd on Hot Beds.

VII. Several ways of making Hot Beds, and their Attendance.

VIII. How and what to be tranſplanted either into Cold Ground, or into New Hot Beds, and how order'd after.

IX. What Obſervations on the Sun, Moon and Weather, for Sowing, Planting and Tranſplanting.

X. How to water and ſhade Plants new planted and Seeds ſowed.

XI. What thrives beſt in the Sun.

XII. What thrives beſt in the Shade.

XIII. What and how ſuch as will not proſper in the Green-Houſe, may be covered and preſerved abroad.

XIV. The ſeveral Names of Worms, Vermine and Inſects that are noxious to the Gardens.

XV. The Remedies.

XVI. The beſt Form and Dimenſion of the Green-Houſe; as alſo of what to build and cover it.

XVII. What to be houſed in Winter.

XVIII. How to order the Pots or Tubs before they are uſed.

XIX. When and in what Weather to open and cloſe the Green-Houſe.

XX. What Obſervations at the firſt ſetting abroad of the Winter-Greens in the Spring.

XXI. How to Prune and Dung the Winter-Greens.

XXII. What may be increaſed by the Root.

XXIII. What by Layers.

XXIV. What by Slips or Cuttings.

XXV. What grows beſt of Seeds that ſhed and ſow themſelves.

XXVI. What to be Grafted and Inoculated.

XXVII.

XXVII. The ſeveral ways of Ingrafting and Inoculating.

XXVIII. How to alter the Shape, Smell, Taſte and Colour of Vegetables, by joining different Roots together.

XXIX. How and what may be changed by Grafting, Joining or Inoculating Shoots or Buds on different Stocks or Cyons.

XXX. How to compound ſeveral Liquors to Water, and feed Vegetables, whereby they may be much altered.

XXXI. Of what Roots, Stalks, Barks, Leaves, Flowers, Fruits, Seeds or Downs, may be made either Cups, Boxes, Baskets, Mats, Callicoes, Cloths, (as Nettle Cloth) and the like, all which will be moſt uſeful for the Life of Man, from the Garden.

XXXII. How to prune Vines, how many Joints to leave, and of what Age the Vine muſt be that is cut away.

XXXIII. How to prune Standard-Trees.

XXXIV. How to prune Wall-Trees, and with what to be beſt faſtned.

XXXV. The Places from whence the beſt of the Vegetables, that are either Winter-Greens,

or fit for the Kitchen-Garden, may be had, and the Marks of their Goodneſs.

XXXVI. How to diſcern good Seeds from bad.

XXXVII. The Times of Gathering, and the Ways of Preſerving them.

Though we have by Journal-Books a fuller Account given us of *Turkey* than of many other Countries, yet becauſe there are in theſe but imperfect Relations of many Things, which yet are needful to be known, it will not be amiſs to make known here the Account of theſe Things, that the Curious Traveller may inform himſelf of them, as he ſhall find conveniency for it.

1. In what Part of *Turky* the *Ruſma* is to be found, and in what Quantity; whether the *Turks* employ it to any other Uſes beſides that of taking off the Hair; whether there be differing kinds of it; how it is uſed to take off Hair, and how to get ſtore of it.

2. Whether the *Turks* do not only take *Opium* themſelves for Strength and Courage, but alſo give it to their Horſes, Camels and Dromedaries, for the ſame purpoſe, when they find them tired and faint in their Travelling; what is the greateſt Doſe any Men are known to have taken of Opium, and how prepared.

3. What Effects are obſerved from their Uſe of *Opium*, as alſo of Coffee, Bathing, Shaving their

their Heads, uſing Rice, and why they prefer that which grows not, unleſs watered, before Wheat, *&c.*

4. How their *Damaſco* Steel is made; and,

5. What is their way of Dreſſing Leather, which, though thin and ſupple, will hold out Water.

6. What is the way they breed thoſe excellent Horſes they are ſo much famed for.

7. Whether they be ſo skilful in poiſoning, as is ſaid, and how their Poiſons are curable.

8. How the *Armenians* keep Meat freſh and ſweet ſo long as it is ſaid they do.

9. What Arts or Trades they have worth learning.

10. Whether there be ſuch a Tree about *Damaſcus* called *Mouſtac*, which every Year, about the Month of *December*, is cut down cloſe by the Root, and within four or five Months ſhoots up again apace, bringing forth Leaves, Flowers and Fruit alſo, and bearing but one Apple, an excellent Fruit, at once.

11. Whether at *Reame*, in the South Parts of *Arabia Fœlix*, there be Grapes without any Grains; and whether the People of that Country live, many of them, to an Hundred and twenty Years in good Health.

12. Whether in *Candia* there be no poiſonous Creatures; and whether thoſe Serpents that are there are without Poiſon.

13. Whether all Fruits, Herbs, Earths and Fountains are naturally ſaltiſh, in the Iſland of *Cyprus*; and whether thoſe Parts of this Iſle, which abound naturally in Cyprus-Trees, are more or leſs healthful than others.

14. What ſtore of *Amianthus* there is in *Cyprus*, and how they work it.

15. Whether Mummies be found in the Sands of *Arabia*, that are the dried Fleſh of Men, buried in thoſe Sandy Deſarts in Travelling; and how they differ in their Virtue from the embalmed ones.

16. Whether the Parts about the City of *Conſtantinople*, or *Aſia Minor*, be as ſubject to Earthquakes now as they have been formerly; and whether the Eaſtern Winds do not plague the ſaid City with Miſts, and cauſe that Inconſtancy of Weather it is ſaid to be ſubject to.

17. Whether the Earthquakes in *Zant* and *Cephalonia* be ſo frequent, as to happen now and then nine or ten times in a Month; and whether theſe Iſles be not very Cavernous.

18. What is the Heighth of Mount *Cacaſus*, its Poſition and Temper in ſeveral Parts, *&c.*

19. With

19. With what Declivity the Water runs out of the *Euxian Sea* into the *Propontis*, with what Depth; and if the Main Tides and Eddies, ſo famous by the Name of *Euripi*, have any certain Period.

20. If in the *Euxine Sea* there can be found any Sign of the *Caſpian Sea*'s emptying it ſelf into it by a Paſſage under Ground; if there be any different Colour or Temper, as to Heat or Cold, or any great Emotion in the Water, that may give Light to it.

21. By what Inland Paſſages they go to *China*, there being now a Paſſage for Caravans throughout thoſe Places, that would formerly admit of no Correſpondence, by reaſon of the Barbariſm of the Inhabitants.

22. Whether in the Aqueducts they make, they line the Inſide with as good Plaiſter as the Ancients did, and how theirs is made.

23. To enquire after the excellent Works of Antiquity, with which that Country is full, and which by the Ignorant are not thought worth Notice or Preſervation; and particularly what is the Structure and Bigneſs of the Aqueducts made in ſeveral Places about *Conſtantinople* by *Solyman* the Magnificent.

24. To enquire whether the Relations of a whole City's being turned into Stone be true; and if not, what gave the firſt Riſe to it; and

whether it lie ſo near the Sea that thoſe Bodies ſo metamorphoſed may be eaſily brought into *Europe*. Here I beg the Reader's Leave to digreſs a little, and give him the Information I had of it from one who was upon the Place, did ſee this ſtrange Metamorphoſis, and had an Account of it from one who lived near to it, which I the rather adventure to do, becauſe I have had good Proofs of his Veracity in other Relations, and alſo becauſe I had the ſame confirm'd to me in great meaſure by a Gentleman who had been long a Chaplain to the Factory at *Smyrna*, who aſſured me, That there's no doubt of it. 'Tis this: Being obliged to go with the Army ſent by the Baſſa of *Tripoly* to reduce a City that had rebelled againſt him, in the way, he and ſome others, after Leave got from their Commander, did turn aſide to ſee this ſo ſtrange Metamorphoſis; at his firſt coming into the Place he ſaw a Sheep lying upon her Belly, as if it were chewing the Cud, whoſe Head he broke off from her Neck with a Stone, and in the Gullet he could perceive ſome remainder of the chew'd Graſs all petrified, which he took up, and ſold afterwards to one of his Fellow-Slaves, who, having ſent it to the Pope, had his Ranſome returned for it. A little farther they ſaw a Woman ſitting on her Knees, with her Hands in a Trough, as if ſhe were kneading Dough, her Mantle that was claſp'd about her Neck being caſt backward, and all turned to Stone, ſo hard, that they could lift her and the Trough in which the Hands were, without parting them or breaking any thing. When he asked a Prieſt that was ſent from the City to treat with the Commander, what way this

this did happen; he anſwered him, That all the Inhabitants of that Place were *Sodomites*, and that God rained down Fire and Brimſtone from Heaven upon them; upon the which they were all turned to Stones: And for Proof of this, he deſired him to dig in the Sand, with his Hand, a Foot deep, which he found like blue Aſhes; which, ſaid the Prieſts, were the Remainders of that Fire.

But to return to our Subject, the next Enquiries ſhall be for *Egypt*. And,

1. Whether it rain at any time; and if ſo, at what time of the Year; and what Influences that Rain hath upon the Air, as to the making it Wholeſome or Peſtilential, or otherwiſe Unwholeſome.

2. To conſider the Nitre that is made there, to try what Affinity there is between the Nitre we have and theirs, whether it diſcover an Alkaly Nature by its Colluctation with Acids, as ſome report, and whether after diſſolving in Water, Filtration and Evaporation, it give Chryſtals like to Nitre.

3. Whether the Earth of *Egypt*, adjoining to the River *Nilus*, preſerved and weigh'd, daily keeps the ſame Weight, till the ſeventeenth of *June*, and then grows daily heavier, with the Increaſe of the River.

4. Whe-

4. Whether, if the Plague be never ſo great before, yet on the firſt Day of the *Nile*'s Increaſe, it not only not increaſeth, but abſolutely ceaſeth, not one dying of it after; and whether this be juſtly attributed to the ſwelling of the *Nile*, or the cool Winds that happen about that Time, and come from the diſſolving of the Snows on the *Riphæan* Hills behind *Greece*, which being impregnated with the Nitrous Particles of the Snow, doth both fan the Air of *Egypt*, and communicate to it an Anti-peſtilential Quality; which I the rather am inclin'd to believe, becauſe Judicious Men do attribute in part the ſwelling of the *Nile* to theſe *Eteſiæ*, that blowing hard on the Mouth of the *Nile*, force its Waters back again into its Channel, which meeting with the Land-flood, that is at the ſame time occaſion'd by the great Rains happening at that Time on the Mountains of the *Moon*, do make the River overflow its Banks.

5. To enquire particularly into the manner of hatching Eggs in *Egypt*; how the Camels Dung is prepar'd, wherein they are laid; how often the Eggs are turned; how covered; whether they hatch in one and twenty Days, as they do with us under a Hen; whether the Chickens be as perfect as ours; if imperfect, whether that may not happen to them with rough handling, while they are removed, being very tender, out of the Place where they are hatched; to take the Deſign of the manner, how by the Pipes the Heat is conveyed to ſeveral Rooms; how they treat them betwixt the time of their Hatching and

and Taking away by the Owners; whether they do not alſo uſe to hatch Eggs under Hens.

6. To enquire if the Yellow Amber that is ſold in *Egypt* in great quantity, be the Gum of a Tree growing in *Egypt*, or *Ethiopia*, as *Bellonius*, after *Diodorus Siculus*, affirms; and whether, beſides ſeveral Animals, that are found incloſed in that Amber, there is frequently found ſome part of the Bark of a Tree ſticking to it.

7. To enquire of a certain Tree, growing not far from *Cairo*, which bears a Fruit ſtuffed with Wool, that is finer than Silk, of which the *Arabs* make Linnen that is ſofter than Silk, and whiter than Cotton.

8. Whether Crocodiles that are found to be ſometimes thirty foot long, are hatched of an Egg no bigger than a Turkey's.

9. Whether the Ichneumon, or Egyptian Water-Rat, can kill a Crocodile, by skipping into his Mouth, and gnawing his way out, as Old Writers affirm.

10. Whether it be true, That the *Arabs* can charm the Crocodiles, or whether there be on the *Nile*'s ſide any *Taliſmans*, or Conſtellated Figures, beyond which the Crocodiles cannot paſs, as ſome would make us believe.

11. To enquire at *Cairo* for ſeveral Druggs, which are common there, and much in uſe, yet not brought into *Europe*, as *Acacia*, *Calamus Odoratus*,

Odoratus, *Amomum*, *Coſtus*, *Ben Album*, and divers ſuch others.

12. Whether the Female Palm-Tree be not Fruitful, unleſs ſhe be planted by the Male, as ſome would bear us in Hand.

13. To enquire whether the Appearance of Legs and Arms of Men, related to ſtand out of the Ground, to a great Number, at five Miles from *Cairo*, on *Good-Friday*, do ſtill continue, and how that Impoſture is perform'd.

14. Whether Children born in the Eighth Month do uſually live there, contrary to what is believed to happen elſewhere.

15. To take an Account of the Wooden Locks there, which are ſaid to be made with as great Art there, as our Locks here.

16. To obſerve the Courſe of the Waters both in the *Mediterranean* and the *Red Sea*.

Enquiries

Enquiries for Guiney.

1. Whether the River *Niger* overflows the Country yearly, like *Nilus*.

2. Whether Rain, when it falls, be often very hot; whether it rots the Cloaths, if not preſently dried, and breeds Worms in them.

3. Whether the Gold there differs in the Fineneſs, and that which lies uppermoſt in the Mine be the fineſt.

4. Whether the Palm yields Wine, Oil, Vinegar, Soap, and Bread; and whether out of the Leaves they pick Threads, making thereof very curious Works.

5. Whether they have beſides their Palm-wine, a Drink made of Grain, like our Ale; what Grain that is, and how prepared.

6. Whether ſome People on the River *Gambra* be only Tawny, as others very Black.

7. Whether the Negroes have ſuch ſharp Sights, that they diſcover a Ship farther off at Sea than an *European* can.

8. What Reaſon there is to conclude, That the Common People being accuſtomed to drink Water, is the Cauſe that they are troubled with Worms

Worms in their Bodies, very painful to them, and difficult to get out.

Enquiries for Poland, *and the adjacent Country, especially such as are more Northerly.*

1. What is the way of making Pot-ashes in *Poland:*

2. What is to be observed about Succinum or Amber; whether it be an Exudation of the Sea; whether it be soft when 'tis first cast on Shore; at what Season of the Year, and in what manner 'tis taken up, *&c.*

3. What is to be observed in the digging of *Sal Gemmæ* in *Poland*; and what is the Depth of the Mines stored with the Salt; and what their Distance from the Sea.

4. What Truth there is in that Relation, of Swallows being found under Waters congeal'd in Winter, and reviving, if they be fish'd and held to the Fire.

5. Whether there be in the *Bodnick Bay* a Whirl-pool, as is related to be in the Sea of *Norway*, which is commonly called the *Meal-stroom*; and whether ther be any Signs that relate the Communication of these Gulphs with the Subterraneous Passages, as *Kircher* says in his *Mundus Subter.* T. 1. p. 146.

6. To

6. To what Depth the Cold in theſe Parts pierces the Earth and Water.

7. Whether their Watches go ſlower by the intenſe Cold.

8. Whether their Oil, in great Colds, is turned into true, that is to ſay, hard and brittle Ice.

9. Whether they can freeze there a ſtrong Brine of Bay-Salt, a ſtrong Solution of *Sal Gemmæ*, or Soot, or a ſtrong Solution of Salt of Tartar, or Sugar of Lead.

10. Whether they can congeal meet Blood, all the ſerous Part thereof being ſevered. *Item*, *Canary* Wine, Solutions of all Salts, and ſtrong Solutions of Metals.

11. Whether an intenſe and laſting Froſt makes any Alteration in Quickſilver, expoſed very ſhallow, in a flat Veſſel.

12. Whether the Purgative Virtue of Cathartick be increaſed or diminiſhed, or even totally deſtroyed by a ſtrong continual Cold.

13. Whether Harts-Horns thawed will give the ſame Quantity of Spirits, by the ſame Method of Diſtilling which they uſe to yield, when not frozen.

14. What

14. What Cold operates in the Fermentations of Liquors.

15. Whether Birds and wild Beasts grow white there in Winter-time, and recover their Native Colour in Summer.

16. Whether Colours may be concentred by Cold, *e. g.* a strong Decoction of Cochineal in a fit Glass.

17. Whether the Electrical Virtue of Amber, and the Attractive Force of the Magnet be changed by a vehement Cold.

28. Whether Pieces of Iron and Steel, even thick ones, be made brittle by intense Frosts; and therefore Smiths are obliged, for Prevention, to give their Iron and Steel Tools a softer Temper.

19. Whether accurate Observations evince, That all Fishes die in frozen Waters, if the Ice be not broken; where it is diligently to be enquired into, Whether the Cold it self, or the want of Changing or Ventilating the Water, or the Privation of Air, be the Cause of the Death of Fishes.

20. Whether any skilful Anatomist has enquired, by Freezing to Death some Animals, (as Rabbets, Pullets, Dogs, Cats, *&c.*) after what manner it is that intense Cold kills Men; whether they have found Ice in the inward Parts, as the Brain and Heart, and in the greater Vessels.

Enquiries into Hungary *and* Tranſilvania.

1. What is obſervable in *Hungary*, *Tranſilvania*, and the neighbouring Parts, as to Minerals, Springs, Warm Bath, Earths, Quarries, Metals, *&c.*

2. Particularly, to enquire into the ſeveral ſorts of Antimony, or Antimony Ore, to be found in *Hungary*, and to inform us of the ſeveral Places whence they are digged, to the End they may be ſent for.

3. To enquire where the beſt *Hungarian* Vitriol is to be found, and the *Cinnabaris Nativa.*

4. To give us a right Account of the right Gold and Silver Earth-Ore, ſaid to be found at *Cranach* in *Hungary*; whence the Gold is called *Cranach Gold*, firſt lighted upon by the Care of the Emperor *Rudolphus*, and chimically wrought by his Order and Inſpection.

5. To enquire and ſend over ſome of that kind of Vitriol, which by credible Perſons is affirmed to be found Cryſtallized in *Tranſilvania*; as alſo after the Vitriol, ſaid to yield Gold.

6. To inform us of the Salt-Pits in *Tranſilvania*, ſaid to yield two ſorts of perfect Salt, the

the one being a *Sal Gemmæ*, the other a common Table-Salt; to obſerve how deep theſe Salt-Mines lie from the Surface of the Ground; how deep they are digged hitherto, and what Damps are met with in them.

7. To enquire after the Veins of Gold and Quickſilver at *Cremnitz* in *Hungary*; and the Vein of Silver at *Schemnitz* in the ſame Kingdom.

8. To enquire whether the Waters of the *Thermæ* that paſs by *Schemnitz*, depoſe a certain Sediment, which in time turns into a yellow Stone.

9. Whether in the Mines of Gold, Silver, Copper, Iron, Lead in *Hungary*, there be generally found Quick-ſilver and Sulphur.

10. Whether it be true, That in the Copper-Mines of the Place called *Herren-Ground* in *Hungary*, there be found no Quickſilver at all.

11. Whether it be true, That in ſome Parts of the *Upper-Hungary* the Ores of Copper, Iron and Lead, be ſometimes ſo commixed, that there is often found in the upper of the Concrete Matter of Iron, in the midſt Matter of Copper, and in the lowermoſt Lead; and that in other Parts of the Country, Copperiſh Fluors are mixed with Leaden ones.

12. Whether it be true what *Athanaſius Kircher* writes from Relation, That the Ductus of

Metals do ſometimes run North and South, and ſometimes croſs-ways.

13. Whether it is true what *Busbequius* reports, Of a River in *Hungary*, whoſe Water is ſo hot, and yet ſo full of Fiſh, that he ſaith one would expect that all the Fiſh drawn thence would come out boil'd.

14. Whether there be Springs about *Buda*, or *Alba Regalis*, that riſe at the bottom of the River, ſo hot, that thoſe who go to bathe, dare not put their Feet ſo low as the Sand, for fear of having them parboil'd.

15. Whether there be in *Hungary* an *Avernus*, that exhaleth always ſuch poiſonous Steams, that Birds flying over it do oftentime fall down, either ſtupified or quite dead; what are the Particulars of this, as to Taſte, Smell, Colour, Heat or Cold; whether any Waters run into it, and what Minerals are found near about it, to which theſe Qualities can be moſtly attributed.

16. Whether the Iron that is ſaid to be turned into Copper by the Vitriolate Springs at *Cremnitz* or *Schmolnitz* in *Hungary*, do, after that Tranſmutation, or Precipitation, contain a pretty deal of Gold.

17. Whether the Depth of the Gold-Mines of *Hungary* be Two thouſand four hundred Feet.

18. What

18. What Quantity of Gold is got out of an hundred weight of Ore, and whether it be got alone, or mixed with other Metals in the Ore.

19. Whether they find Trees, or any other Salt, in the solid Salt of their Salt-Mins.

20. Whether there be a great Lake in *Moravia*, whence the Waters at a certain Time of the Year are all drawn away, by great Holes in the middle of it, leading through subterraneous Passes, and that so suddenly, that the Fish are left on the Ground, which afterward becomes good Pasture for another part of the Year, the Waters then returning by the same Passages they went out, and that with so much Force that it rises like a Jet of Water.

21. Whether it is true, That in some Parts of *Hungary*, near the Gold Mines, the Leaves of their Trees have their lower Superficies, if not their upper also, gilded over with yellowish Exhalations.

22. What is the way said to be used in *Hungary* and *Austria*, of extracting the Perfect Metals out of their Minera's without Lead, performed by casting a Powder upon the Minera, which makes a quick and advantagious Separation, Sulphur being supposed to be an Ingredient of it.

Enquiries for Suratte, *&c.*

1. Whether it be true, that Diamonds and other Precious Stones, do grow again after three Years, in the ſame Places where they have been digged out.

2. Whether the Quarries of Stone near *Fettipore*, not far from *Agra*, in the Mogul's Dominions, may be cleft like Logs, and ſawn like Planks to ciel Chambers and cover Houſes therewith; likewiſe whether about *Sadrapatan*, on the Coaſt of *Cormandel*, there be a Stone of the like nature, ſo as ſetting a Wedge upon it, one may cleave it with a Mallet, as thick or as thin as one pleaſeth; and whether it be of the Nature of our Fire-ſtone, that is prepared by the Stone-cutters for Ovens.

3. Whether upon the ſame Coaſt of *Cormandel*, about *Toutoucourin*, and that of *Ceylan* at *Manar* and *Jafanapatan*, they fiſh Pearls as good as thoſe about *Ormus*; whether thoſe Pearls are the better, the deeper they lie; what is the greateſt depth they are known to have been taken at; and whether it be true, that ſome of the Natives there can ſtay under Water half an Hour without any Art.

4. Whether the Iron in *Pegu* and *Japan* be far better than ours; and if ſo, what is to be obſerv'd

observ'd in Melting, Forging and Tempering of it.

5. Whether in *Sumatra* there be a Fountain running a very Sanative Oil; and whether the Ignivomous Mountain in the same Country do burn continually, and cast out Stones so eaten by the Fire that they swim.

6. What is the Opinion of the more Inquisitive Men in these Parts of *Ambergris*, and whether the greatest Quantities of it are found about the Isle *Mauritius*.

7. Whether it be Winter on the East-side of the Mountain *Gates*, which comes from the North Cape *Comorin*, whilst it is Summer on the West-side, and so *vice versa*.

8. Whether it be true, That upon the Coast of *Coromandel*, sixteen Degrees Northern Latitude, between *Peleacate* and *Maselipatan*, fifty Leagues in length, the hot Winds blowing from the Landward, from eight in the Morning till four in the Afternoon, with such a suffocating Heat, that the Inhabitants are not able to endure it, without extraordinary Helps and Refreshment: Every one, for his Provision of Drink, daily hangs his Bottle, made of common Pot-Earth, and filled with Well-water, or other potable Liquor, upon some Post, Tree or Wall, in Places where the Sun and Wind are most piercing, leaving it all the Day long there in the scorching Heat; and then taking it up about four a Clock in the Evening, the Drink is more

cool than any depth of Cellaridge can make it: And whether, on the contrary, the Bottles being ſuffered to continue in the Air, as before, the cool Sea-Gales, which come in after the ſaid Hour, and continue all Night, till eight in the Morning, to the Refreſhment of all Creatures, the Liquors grow hot and unfit for Drink.

9. Whether the Tide, near *Mindana*, going from the *Molucca's* to the *Philippina's*, are ſo ſwift, that neither contrary Winds nor Anchors can ſave a Ship from being carried away by it; and that it riſes about three or four Feet; and whether the like be obſerv'd in the Bay of *Cambaia*, and in that between *Martagan* and *Pegu*: And particularly, whether in the ſaid Bays the Tides come in with that Impetuoſity and Swiftneſs about the Quarters of the Moon, that the Watchmen from high Towers muſt give Warning to the People to retire; and that a Horſe, in his ſwifteſt Courſe, when ſuch a Tide comes upon it, as *Iſaac Voſſius* obſerves, *lib. de motu Marium & Ventorum*, c. 15. And what other Particulars are obſervable in all theſe Coaſts about the Tides.

10. Whether there be any Diſcoveries newer than the neweſt Painted Maps of the Parts of the World North-Eaſt of *Japan*; and whether *Japan* be truly an Iſland, or no.

11. What is the true way of Making and Colouring *China* Diſhes, and how in *China* and *Japan* they make the Black Varniſh.

12. With

12. With what Materials, and how they paint on Cloth, commonly called *Pintados*, and likewiſe upon Canvas, *&c.*

13. Whether *Lignum Aloes* be the Wood or Root of a Tree; in what Country it is found; and how to know the beſt of the kind.

14. Whether the beſt Tea be that which comes forth at the firſt of the Spring, and are the Top-Leaves; in what manner 'tis dry'd, and whether the too haſting drying thereof hurts it.

15. Whether there grows a Wood in *Java*, that naturally ſmells like Humane Excrements; and if ſo, what kind of Ground it grows in.

16. Whether in the *Malacca Iſlands* there be a Red Wood, which burns, ſparkles, and flames, without being conſumed, yet may be reduced to Powder, by rubbing between ones Fingers.

17. Whether near the Fort of *Ternate* there be a Plant called by the Inhabitants *Catopa*, whence fall little Leaves, which are turned into Butterflies.

18. Whether in *Pegu* and other Places they uſe a Poiſon that kills by ſmelling, and yet the poiſonous Smell is hardly perceived.

19. Whe-

19. Whether it be true, That the only Antidote, hitherto known, against the Famous and Fatal *Macaſſar* Poiſon, is Humane Ordure taken inwardly; and of what Subſtance that Poiſon is made of.

20. Whether there be ſuch a Vegetable in *Java*, called *Mangas Bravas*, that is ſo poiſonous, that it kills preſently, and for which no Remedy hath been yet found.

21. Where the beſt *Calumba* Wood, or *Palo d'Aquila*; whether the *Palo d'Aquila* be much inferior to *Calamba*, and how they are diſtinguiſh'd; whether the latter be the Pith of the former; whence the beſt ſort comes; whether it be ſtored with a Rich and Cordial Balm, and that be the Cauſe of its great Rate, being much uſed in the Decay of Spirits, and the Lameneſs and Impotency of Nerves.

22. Whether they draw an Oil, reſembling Oil of Camphire, from the Roots of the Cinnamon-Tree, and how they draw it.

23. Whether the Camphire of *Borneo* be not the Exudation or Gum of a Tree.

24. Whether the *Indians* can ſo prepare that ſtupifying Herb, called *Dutroa* or *Datura*, that they make it lie ſeveral Days, Months and Years, according as they deſign it, in a Man's Body, without doing him any Hurt, and at the end kill him, without miſſing an Hour's time.

25. Whe-

25. Whether the *Betele* hath such a Contrariety to the *Durion*, that a few Leaves of that, put to a whole Shopful of *Durions*, will make them all rot suddenly; and whether those that have surfeited on *Durions*, and thereby overhearted themselves, do, by laying a Leaf or two of *Betele* upon their Breasts or Stomachs, immediately cure the Inflammations, and Recover.

26. Whether the *Papayas*, which bear Fruit like a Melon, do not beat unless Male and Female (as the Vulgar distinguishes them) stand together.

27. Whether there be two sorts of Trees called *Arbor Triste*, one by the Name of *Triste di Die*, the other *Triste die Notte*, whereof the former sheds his Flowers at the Rising, the other at the Setting of the Sun; and whether the distilled Water thereof (called *Aqua di Mogli* by the *Portugals*) may not be transported into these Parts.

28. Whether one of these Trees, called *Arbre de Rays*, propagates it self into a whole Forest, by shouting up and letting fall its Branches into the Ground, that spring up again, and so on; and whether there be any single ones of these Trees, that are above fifty Feet in Diameter, as some affirm.

29. What Particulars are observable in other Plants of those Parts.

30. Whe-

30. Whether thoſe Shel-fiſhes that are in thoſe Parts plump and in Seaſon at the Full Moon, and lean and out of Seaſon at the New, are found to have contrary Conſtitutions in the *Eaſt-Indies*.

31. Whether the Animal that yields the true Musk, be like a Deer, horules, found in the high Country between *Pegu* and *China*; and whether the Musk grows in Bags, Bliſters, or Swellings, which the Beaſt rubs off againſt Trees, it being affirmed to have been found in the Woods by the Scent; whether True Musk is diſcerned from the Falſe by its Yellowneſs, when rubbed upon ones Hand, and by its keeping that Colour and the Scent.

32. Whether there be two ſorts of *Gum Lack*, one produced by an Inſect, a certain winged Ant, the other the exſudation of a Tree.

33. To enquire after the Fiſh called *Cabala*, ſaid to be very powerful in ſtaunching of Blood.

34. Whether at *Java* there be Oiſters, or other Shell-fiſhes, of that bigneſs, as to weigh 300 Pounds.

35. Whether in *Malacca* there grows ſometime a Stone in the Stomach of a kind of Porcupine, called *Pedro Porco*, eſteemed for its Cordial Virtue above *Bezoar*.

36. Whether there be found in the Head of a certain Snake, a Stone, which laid upon a Wound of

of any venomous Creature, ſticks faſt to it, and draws away all the Poiſon; then, being put into Milk, voids its Poiſon, and turns the Milk blue; and then applied again, draws the reſt of the Poiſon that may be behind, till the Wound be perfectly cured.

37. Whether the Rhinoceros have ſuch an Antipathy againſt Elephants, as is commonly reported.

38. Whether in the Iſland of St. *Helena*, the Tide be at the ſame time round in the ſeveral Coaſts of it; and what is the Hour of full Sea, and what the Age of the Moon at the Time of Obſervation.

Enquiries

Enquiries for Perſia.

1. What are chiefly the preſent Studies of the *Perſians*, and what kind of Learning they now excel in.

2. What other Trades and Arts they are now skilled in, beſides that of making of Silk and Tapiſtry.

3. Whether, there being already good Deſcriptions in Words, of the excellent Pictures and Baſſe Relieves, that are about *Perſepolis* at *Chimilnar*, yet none very particular, ſome may not be found ſufficiently skill'd, in thoſe Parts, that might be engaged to make a Draught of the Place, and the Stories there Pictured and Carved.

4. How they make that Plaiſter, wherewith in *India* and thoſe Parts they line their Tanks or Ciſterns, and which, when dry, ſhines like Marble, and is much harder.

Enquiries for Virginia *and* Bermudas.

1. Concerning the Varieties of Earths; 'tis ſaid there is one kind of a Gummy, Clear Conſiſtence, White and Clear; another White, and ſo light, that it ſwims upon Water; another Red, called *Wapergh*, like *Terra Sigillata*: *Quære*, What other conſiderable Kinds are there; and to ſend over a Parcel of each.

2. What conſiderable Minerals, Stones, Bitumens, Tinctures and Drugs.

3. What Hot Baths, and of what Medicinal Uſe.

4. What is the Original of thoſe large Navigable Rivers which empty themſelves into the Bay *Cheſapeak*; and whether on the other ſide of that Ridge of Mountains, from which they are ſuppoſed to proceed, there be not other Rivers that flow into the *South Sea*.

5. How the Silk-Graſs is prepared.

6. To give a full Account of that Vulnerary Root called *Wichacan of Pocone*, a Root of a red Juice, a good Tincture: Of *Muſquaſpem*, a Root of a red Tincture: Of the Plant *Maricock*, whoſe Fruit is ſaid to be faſhioned like a Lemon, exceeding pleaſant to the Taſte, of a Bloſſom moſt beautiful: Of the *Chinçomen* Tree, whoſe

whose Fruit is said to have a Husk like a Chesnut, Luscious and Hearty Meat, both Raw and Boiled.

7. Whether there be in the *Bermudas* a Poison-Weed, like our Ivy, whose Leaves do by the Touch cause Blisters; and a Reed whose Juice or Infusion causeth Vomit.

8. What kinds of Trees these Barks are taken from, that are used instead of Tile or Slate, in the Covering of their Houses, being cooler in *Summer* and warmer in *Winter* than Stone.

9. To give a particular Account of the Spider in the *Bermudas*, said to be Large and Beautiful for its Colours, weaving a Web betwixt several Trees, which is affirmed to be for Substance and Colour like perfect raw Silk, so strong, that Birds like Snites are snared therein.

10. Whether Deer have generally their three or four Fawns at a Brood; and whether any of the Cattle, transported from hence, becomes there more Fruitful than they were here.

11. Whether the Relation be true, of a Glue made of Harts-horn, that will not dissolve in Water; and if so, how made.

12. Whe-

12. Whether, at the Bottom of the Bay of *Cheſapeak*, Northward, the Natives be ſtill of ſuch a Gigantick Stature, as has been reported; and whether there be another, not far from theſe, Eaſterly, of a Dwarfiſh Stature.

13. Whether round about the Coaſt of the *Bermudas* the Tides keep the ſame Time, and at what a Clock, preciſely, it is High-water on the Days of Full and New Moon, and how high the Water riſes then; and the like on the Coaſts of *Virginia* and *Florida*.

Enquiries for Guaiana *and* Braſil.

1. Whether about *Orabba*, near *Oronoque*, ſome eight Degrees Northern Latitude, and about the Town *Darien*, Toads may be produced, by throwing a kind of Mooriſh Water, found there, upon the Floors of their Houſes. *Linſchotten.*

2. Whether it be true that the Locuſt of *Braſil*, called *Caayra*, changeth in the Spring-Time into a Plant, and withers away like a Plant; and whether, in the ſame Country, that kind of *Eruca*, which is called by the *Portugals Legartas des Verias*, turns into a Bird, admirable for Colour and ſwift flying, the Change thereof being made ſo leiſurely, that one may for a while ſee half of the Inſect, and the other half of the Bird, which the Natives call *Guianumbi*, the *Portugals Pegafrel. Piſo.*

3. Whether upon the Leaves of that *Braſilian* Tree, called *Cereiba*, there is, in a Sun-ſhiny Day, found a white Salt in that Quantity, that one may gather as much from two or three Leaves as will ſalt a good Pot of Broth. *Piſo.*

4. Whether there be found about the Mouth of the River *Amazones*, a green *Argilla*, which, though very ſoft under Water, grows almoſt as hard as a Diamond, inſomuch that the Natives make Hatchets of them, ſtrong and ſharp enough

enough to cleave Wood; for which purpoſe alſo it is ſaid thoſe *Indians* are ſaid to have uſed it, before they got Iron ones; and whether this *Argilla* become Stone, have a peculiar Virtue againſt the Epilepſie, when carried by the Patient. *Pelleprat*, in his Relation of the *Iſlands*, and *Terra Firma* of the *Southern America*.

5. Whether the black Bees in *Guaiana*, about the River *Orenoque*, make black Honey and Wax; and whether they have no Stings, as the ſame *Pelleprat* affirmeth.

Enquiries and Directions for the Antiſles, *or* Caribe Iſlands.

I. *Of Vegetables.*

1. Whether the Juice of the Tree *Jumpa*, being as clear as any Rock Water, yields a brown Violet Dye, and being put twice upon the ſame Place, maketh it look black; and whether this Tincture cannot be got out with any Soap, yet diſappears of it ſelf in nine or ten Days; and whether certain Animals, particularly Hogs and Parrets, eating of this Fruit, have their Fleſh and Fat altogether tinged of a Violet Colour.

2. Whether Ring-Doves, that feed upon the bitter Fruit of the *Acomas* Tree, have their Fleſh bitter alſo?

3. Whether the Wood of the *Acajou* Tree, being red, light, and well-ſcented, never rots in the Water, nor breeds any Worms when cut in due Seaſon; and whether the Cheſts and Trunks made thereof keep Cloaths, placed therein, from being Worm-eaten.

4. Whether the Leaves of a certain Tree, peculiarly called *Indian* Wood, give ſuch a haut Gouſt to Meats and Sauces, as if it were a Compoſition of ſeveral ſorts of Spices.

5. Whe-

5. Whether there be two ſuch ſorts of the Wood called *Savomer* or *Soap-Wood*, of the one of which the Fruit, of the other the Root ſerveth for Soap.

6. Whether the Bark of the *Paretuvier-Wood*, tans as well as Oak-Bark.

7. Whether the Root of the Tree *Laitus* being brayed, and caſt into Rivers, maketh Fiſhes drunk.

1. Whether the Root of the *Manioc* is ſo fertile, that one Acre planted therewith, yields ſo plentiful a Crop as ſhall feed more People than ſix Acres of the beſt Wheat.

9. What Symptoms do uſually follow upon the taking the Juice of *Manioc*, or upon eating the Juice with the Root, and what Effects are thereby produced upon the Body, that infer it to be accounted rank Poiſon; whether worſe Effects than theſe may be cauſed by meer Crudity, as by Turnips and Carrets eaten raw, and much more by raw Fleſh, in thoſe that are not uſed thereto, or at moſt ſome nauſeous or noxious Quality, as might be corrected in the Taking or Preparation, which Correction, if effected, might perhaps render the Bread much heartier, the Juice being likely to carry off the Spirit and Strength, leaving the Remainder Spiritleſs.

10. The *Palmetto Royal* being ſaid by *Ligon* to be a very tall and ſtreight Tree, and ſo tough, that none of them have been ſeen blown down, and withal hollow; in all which Reſpects they may ſerve for ſpecial Uſes, and particularly for long Optick Tubes.

11. Whether the Oil expreſſed out of *Ricinus* or *Palma Chriſti*, be uſed by the *Indians* to keep them from Vermine; to ſend over ſome of that Oil.

12. Whether in the Paſſage of the Iſthmus, from *Nombre de Dios* to *Panama*, there is a whole Wood full of Senſitive Trees, of which, as ſoon as they are touch'd, the Leaves and Branches move with a ratling Noiſe, and wind themſelves together into a winding Figure.

13. Whether there be certain Kernels of a Fruit, like a white Pear-plumb, which are very Purgative and Emitick; but having the thin Film, which parts them into halves, taken out, they have no ſuch Operation at all, and are as ſweet as a *Jordaine* Almond.

14. To ſend over ſome of the Roots of the Herb, called by our Author *L'herb aux Fleſhes*, (the Dart-Herb) which being ſtamped is ſaid to have the Virtue of Curing the Wounds made with poiſon'd Darts.

15. To

15. To ſend ſome of the Grain of the Herb Musk, putting it up carefully in a Box, which being in it, will keep its Musk Scent.

16. To ſend over a Specimen of all Medicinal Herbs, together with their reſpective Virtues, as they are reputed there. *Item*, Particularly the *Pricklewith* at the *Barbados*; *Macao*, *Maſtick-Tree*, *Locuſt*, *Black-wood*, *Yellow within*, *Five Sprig*, *Tidle-wood*, *White-wood*, *Barbados Cedar*.

17. Whether the Fruit *Mancenille* of the *Mancenillier-Tree*, though admirably fair and fragrant, yet is fatal to the Eater, and falling into the Water kills the Fiſhes that eat thereof, except Crabs, who yet are ſaid to be dangerous to eat, when they have fed upon this Fruit; whether under the Bark of this Tree is contain'd a certain glutinous Liquor, as white as Milk, very dangerous, ſo that if you chance to rub it, and this Juice ſpurt upon the Shirt like a Burning, if upon the naked Fleſh, it will cauſe a Swelling, if upon the Eye, Blindneſs for ſeveral Days; and whether the Shadow of this Treee be ſo noxious, that the Bodies of Men repoſing, it will ſwell ſtrangely; and whether the Meat it ſelf that is boiled with the Fire of this Wood, contracts a Malignity, burning the Mouth and Throat: Farther, whether the Natives uſe the Milky Juice of this Tree, and the Dew falling from it, and the Juice of its Fruit in the Compoſition of the Poiſon they infect their Arrows with.

II. *Of Animals and Inſects.*

18. Whether the Skin of the *Taton*, and the little Bone of his Tail, do indeed, as is related, cure Deafneſs, and Pains of the Ears; and whether this Animal be Proof, not only againſt the Teeth of Dogs, but alſo againſt Bullets.

19. Whether the Birds called *Canides*, be ſo docile, that ſome of them learn not only to ſpeak *Indian*, but alſo *Dutch* and *Spaniſh*, ſinging alſo the Airs in the *Indian* Tongue, as an *Indian* himſelf.

And whether the Bird *Colibri* have a Scent as ſweet as the fineſt Amber and Musk; both which is affirmed by our *French* Author.

20. To procure ſome of the Fat of the Birds called *Fregats*, reputed to be very Antiparalytical and Antipodagrical.

21. To ſend over a Land-Pike, which is ſaid to be like the Water-Pike, but that inſtead of Fins it hath Four Feet on which it crawls.

22. Whether the Skin of the Sea-wolf, which they otherwiſe call the *Requiem*, be ſo rude and ſtiff, that they make Files of them, fit to file Wood; and whether it be uſually guided by another Fiſh, that is beautified with ſuch a Variety of lively Colours, that one would ſay, That

ſuch

ſuch Fiſhes are girt with Necklaces of Pearls, Corals, Emeralds, *&c.*

23. Whether the Skins of the Sea-Calfs, otherwiſe called *Lamantins*, be ſo hard, when dried, that they ſerve the *Indians* for Shields.

24. Whether the Aſhes of the Freſh-Water Tortoiſes do hinder the falling off the Hair, being powdered therewith.

25. Whether the Land-Crabs of theſe Iſlands do at certain times hide themſelves all under Ground, for ſix Weeks, and during that time change and renew themſelves; and whether in hiding themſelves thus, they do ſo carefully cover themſelves all about with Earth, that the opening thereof cannot be at all perceiv'd, thereby ſhutting out the Air, by which they might elſe be annoyed, when they are quite naked, after they have ſhed their Shells, there then remaining no other Cover on them but a very thin and tender Skin which, by little, thickeneth and hardneth into a Cruſt, like the old.

26. Whether the Serpents in theſe Parts, that have Black and White Spots on their Backs, be not Venemous; ſend over ſome of ſuch Serpents Skins.

27. To ſend over ſome of the Skins of thoſe huge Lizards, called *Ovayamaca*, which, when come to their full Bigneſs, are ſaid to be five Foot long, Tail and all; and eſpecially that are ſaid to

to have the Scales of their Skins ſo bright and curious, that they reſemble Cloth of Gold and Silver.

28. Where the ſhining Flees, called *Cucuyes*, hide almoſt all their Light, when taken, but when at Liberty afford it plentifully.

29. Whether there be a ſort of Bees, Brown and Blue, who make a Black Wax, but the Honey in it whiter and ſweeter than that of *Europe*.

30. Whether in thoſe Parts the *Indians* do cure the Bitings of Serpents by eating freſh Citron Pills, and by applying the Unguent, made of the bruiſed Head of the Wounding Serpent, and put hot upon the Wound.

31. Whether the Wood-Lice in thoſe Countries, generated out of Rotten Wood, are not able, not only to eat through Trunks in a Day or two, and to ſpoil Linnen, Cloaths and Books, (of which laſt they are ſaid only to ſpare what is written or printed,) but alſo to ſupport the Props, which ſupport the Cottages, that they fall; and whether the Remedy againſt the latter Miſchief is, To turn the Ends of the Wood, that are fixed in the Ground, or to rub the Wood with the Oil of that kind of *Palma Chriſti* (a Plant) wherewith the Natives rub their Heads, to ſecure them from Vermine.

32. Whe-

32. Whether that ſort of Vermine they meet with, commonly called *Ravets*, ſpare nothing of what they meet with, (either of Paper, Cloaths, Linnen and Woollen) but Silk and Cotten.

33. Whether the little Cirons, called *Chiques*, bred out of Duſt, when they pierce once into the Feet, and under the Nails of the Toes, do get Ground of the whole Body, unleſs they be drawn out betimes; and whether at firſt they cauſe but a little, but afterwards having pierced the Skin, raiſe a great Inflammation in the Part affected, and become in a ſmall time as big as a Peaſe, producing innumerable Nits, that breed others.

Enquiries for Greenland.

1. What and how much is the Heat of the Sun there in the midſt of Summer, compared with the Heat of it in *England*, to be obſerved with a Thermometer.

2. What is the moſt conſtant Weather there in *Summer*, whether Clear, Cloudy, Rainy, Foggy, *&c.*

3. What Weather is moſt uſual at ſuch and ſuch Times of the Year.

4. What Conſtancy or Unconſtancy there is of the Wind, to this or that Quarter of the Horizon, or to this or that Part of the Year.

5. What the Temperature of each particular Wind is obſerved to be, and particularly whether the North-Wind be the coldeſt; and if not, whether is coldeſt, the Eaſt or the Weſt, *&c.*

6. What Wind is obſerved to bring moſt Ice, and what to make a Clear Water at Sea.

7. What Currents are there, how faſt, and which way they ſet; whether theſe Currents are not ſtronger at one time of the Moon than of another; whether they always run one way.

8. What

8. What is obſervable about the Tides, High Spring or Neap; how high the Water-Mark is above the Low Water; which way it floweth, which way it Ebbeth; what time of the Moon the Spring-Tides fall out.

9. Whether the Ice that floats in the Sea, be of Salt-Water or Freſh.

10. What Rivers there are in the Summer, and what freſh Waters can be had.

11. What Fowl are found to live there, and what Beaſts; how they are thought to ſubſiſt in Winter; how they Breed and Feed their Young.

12. What Vegetables grow there, and whether they yield any Flowers or Fuits, *&c.*

13. Whether there have been any Thunder or Lightning obſerved in thoſe Parts, as is obſerved in *Norway.*

14. How deep the Cold penetrates into the Earth, and whether there be any Wells, Pits or Mines ſo deep that the Cold does not reach the Bottom thereof.

15. How the Land tends, and whether the Parts under or near the Pole, be by thoſe that have gone fartheſt that way, thought to be Sea or Land; and how near any hath been known to approach the Pole; whether the Cold increaſeth with the increaſe of Latitude.

16. To

16. To make, if poſſible, ſome Experiments and Obſervations about the Magnet or Needle; and particularly how much the Declination is there, and whether they exactly obſerve the Degrees of Declination in their Courſe; likewiſe to make Obſervations about the Heighth of the Sun and other Celeſtial Bodies, and their Diameter, Refractions, *&c.*

17. What is their Opinion concerning the North-Eaſt Paſſage.

18. What Fiſh do moſt frequent thoſe Seas beſides Whales; what is obſervable in their Fiſhing, as the uſual or unuſual Bigneſs and Strength, and the ſeveral ſorts of Whales, and particularly to obſerve whether that kind of Whale they call *Trompa*, have in their Heads the *Sperma Cæti*, and in their Intrals the Ambergreeſe, looking like Cow Dung. *Purchat.*

19. What obſervable Difference there is of the Coldneſs of the Winds, when it blows over great Boards of Ice that are ſeen in theſe Seas, and when not.

20. To give an exact Account of the Whale-fiſhing, throwing the Harping-Irons, following the Fiſh.

21. To deſcribe the whole manner of making the Oil of Whale.

FINIS.